Universidade do Minho
Escola de Psicologia

Celso Simão Fulano

Procrastinação académica a Matemática em alunos de Maputo: Estudos com adolescentes

março de 2017

Celso Simão Fulano **Procrastinação académica a Matemática em alunos de Maputo: Estudos com adolescentes**

UMinho | 2017

Universidade do Minho
Escola de Psicologia

Celso Simão Fulano

Procrastinação académica a Matemática em alunos de Maputo: Estudos com adolescentes

Tese de Doutoramento em Psicologia Aplicada

Trabalho efetuado sob a orientação do
Professor Doutor Pedro Sales Luís da Fonseca Rosário

março de 2017

DECLARAÇÃO DE INTEGRIDADE

Declaro ter atuado com integridade na elaboração da presente tese. Confirmo que em todo o trabalho conducente à sua elaboração não recorri à prática de plágio ou a qualquer forma de fabricação de resultados.

Mais declaro que tomei conhecimento integral do Código de Conduta Ética da Universidade do Minho.

Universidade do Minho, 23 de março de 2017.

Nome completo: Celso Simão Fulano

Assinatura: Celso Simão Fulano

Agradecimentos

Chegado ao fim de uma importante etapa de estudos, gostaria de expressar os meus agradecimentos a todos que de forma direta ou indireta, contribuíram para a realização desta tese.

Um muito obrigado é endereçado ao Professor Doutor Pedro Sales Luís da Fonseca Rosário, pela orientação desta tese, pela sua exigência e rigor científico permanente, que tornaram possível a conclusão deste percurso académico. O Professor esteve sempre presente, o que tornou fácil a minha integração na Universidade do Minho e em Portugal.

Ao Professor Doutor José Carlos Núñez, pelas suas importantíssimas sugestões manifestadas ao longo deste percurso. Muito obrigado.

À Jennifer Cunha, ao Abílio Lourenço e à Paula Magalhães, pela utilidade das suas ricas opiniões e partilha permanente. Muito obrigado.

Aos meus colegas do grupo de investigação, pelo apoio incondicional em todos os momentos do meu doutoramento.

À minha esposa Angélica. Muito obrigado por teres cuidado do nosso lar e dos nossos filhos. Sei que não foi fácil, mas o teu coração é tão grande, o teu amor e a tua vontade incondicional, o sentido de esposa e mãe, tornaram-te a melhor companheira de sempre. Aos nossos filhos Celso Júnior e Ludwig e ao nosso terceiro filho que chega no culminar desta importante etapa. Mais do que uma homenagem, esta tese é resultado da vossa presença e fascínio.

Aos meus pais, Simão Fulano (in memoriam) e Adelina Joaquim e aos meus irmãos pela confiança que sempre transmitiram.

À minha prima, Isabel Baptista, ao Miguel Coito, ao tio Baptista, ao primo Eurico Baptista e sua família, pelo apoio e acolhimento em Lisboa.

Aos meus amigos de Moçambique, de Portugal e de outros contextos, pela amizade e companheirismo, que facilitaram a superação de várias dificuldades surgidas ao longo dos meus estudos.

A presente tese de doutoramento beneficiou do apoio do Camões, Instituto da Cooperação e da Língua, IP, através de uma Bolsa de Doutoramento Individual.

Procrastinação académica a Matemática em alunos das escolas de Maputo: Estudos com adolescentes

Resumo

A presente tese pretende contribuir para a literatura no domínio da procrastinação académica, analisando algumas variáveis que ajudam a explicar a procrastinação académica em matemática. Pretendemos explorar a perspetiva dos adolescentes moçambicanos em aspetos tais como: tarefas nas quais os alunos procrastinam com frequência, os antecedentes da procrastinação e as consequências da procrastinação académica percebidas pelos alunos. Almejamos, também, compreender e analisar a prática dos professores de matemática face à procrastinação académica.

Para atingir estes objetivos, realizámos dois estudos, um de natureza quantitativa e outro de natureza qualitativa. O primeiro estudo ("Academic procrastination in high school students from Mozambique: the role of self-regulated learning, self-efficacy, and prior knowledge of mathematics") foi realizado com 1000 alunos do 10.º e 12.º anos de escolaridade. Neste estudo foram também recolhidos dados junto a professores de matemática. O estudo utilizou um Modelo de Equações Estruturais para analisar as relações entre conhecimento prévio, autoeficácia a matemática, uso de estratégias de autorregulação da aprendizagem e procrastinação académica a matemática. Os resultados sugerem que as relações entre variáveis tais como o conhecimento prévio, autorregulação da aprendizagem e a autoeficácia a matemática são cruciais para a explicação e compreensão da procrastinação académica a matemática. Este estudo permitiu concluir ainda que quanto maior o conhecimento prévio a matemática dos alunos, maior é a perceção da autoeficácia a matemática, autorregulação da aprendizagem e menor é a procrastinação académica a matemática.

O segundo estudo ("It is funnier to chat with our friends than do homework": Mozambican Adolescents' Academic Procratination), foi realizado com 24 alunos do 11.º e 12.º anos, selecionados de um conjunto de 300 alunos que relataram altos níveis de procrastinação académica, e os seus respetivos professores. Os dados deste estudo foram recolhidos através de uma entrevista semiestruturada e interpretados com base na análise de conteúdo. Os resultados deste estudo qualitativo indicaram que todos os alunos participantes procrastinam nos seus TPC de matemática. As razões estão relacionadas com a baixa competência a matemática, seguido do envolvimento em tarefas domésticas, tecnologias e redes sociais e, por último, com a baixa motivação e pouco interesse pela

disciplina. Os resultados indicaram, ainda, que algumas estratégias que os professores utilizam com o objetivo de diminuir a procrastinação têm um efeito contrário. Urge promover estratégias de autorregulação dos alunos e ações de formação para professores sobre a temática.

Os estudos desta tese permitiram-nos, concluir que: 1) o conhecimento prévio é um preditor fundamental da autorregulação da aprendizagem e da autoeficácia a matemática; 2) o modelo de autorregulação da aprendizagem é fundamental para a compreensão da procrastinação académica; 3) a procrastinação académica é um comportamento prejudicial no progresso académico dos alunos; 4) os programas de treino de estratégias de autorregulação de aprendizagem podem integrar a planificação das atividades de estudo diário, elaboração de horário de estudo diário e de realização dos TPC, bem como a gestão de tempo.

Os dados sugerem 1) a necessidade de formação de professores para a promoção de competências de estudo e de autorregulação com o objetivo de tornar os alunos cada vez mais proficientes na autorregulação da sua aprendizagem; 2) e a necessidade de desenvolver programas de treino de alunos em estratégias para evitarem a procrastinação académica, sobretudo em idades escolares mais baixas.

Palavras-Chave: Procrastinação académica, autorregulação da aprendizagem, conhecimento prévio, autoeficácia a matemática

Abstract

The present thesis aims to contribute to the literature in the field of academic procrastination by analysing some variables that may help to explain academic procrastination in mathematics. We intend to explore the perspective of Mozambican adolescents in aspects such as: tasks in which students engage in when they procrastinate, antecedents of procrastination, and the consequences of academic procrastination perceived by students. We also aim to understand and analyse the practice of mathematics teachers towards academic procrastination.

To accomplish these goals, two studies were conducted, one quantitative and the other qualitative. The first study ("Academic procrastination in high school students from Mozambique: the role of self-regulated learning, self-efficacy, and prior knowledge of mathematics") was carried out with 1000 students of the 10th and 12th grades of schooling and mathematics teachers. A Structural Equation Model was used to analyse the relationships between prior knowledge in mathematics, self-regulated learning, self-efficacy in mathematics and academic procrastination in the mathematics. The results suggest that the relationships between the aforementioned variables are crucial to explain and understand academic procrastination in mathematics. This study allowed to conclude that the higher the students' prior knowledge in mathematics the greater the perception of self-efficacy in mathematics and self-regulated learning, and the less the academic procrastination in mathematics.

The second study ("It is funnier to chat with our friends than homework": Mozambican Adolescents' Academic Procrastination) was carried out with 24 students of the 11th and 12th grades selected from a group of 300 students who reported High levels of academic procrastination, and their respective teachers. Data from this study were collected through a semi-structured interview and interpreted based on content analysis. The results of this qualitative study indicated that all participating students procrastinate in their mathematics homework. The reasons are related to low competence in mathematics, followed by involvement in household tasks, technology and social networks, and low motivation and little interest in the subject. The results also indicated that some strategies that teachers use to reduce procrastination behaviors among students have an opposite effect. It is urgent to promote strategies for self-regulation of students and training actions for teachers on the subject.

The studies of this thesis have allowed us to conclude that: 1) prior knowledge is a fundamental predictor of self-regulated learning and self-efficacy in mathematics; 2) the model of self-regulated learning is fundamental to understand academic procrastination; 3) academic procrastination can be a detrimental

behavior in students' academic progress; and 4) self-regulation strategies training programs can integrate the planning of daily study activities, preparation of daily study time, and carrying out the math homework, as well as time management.

To conclude, results suggest (1) the need of teachers training to promote study and self-regulation skills to make students increasingly proficient in the self-regulation of their learning; and 2) the need to develop students' training programs in strategies to avoid academic procrastination, especially at lower school ages.

KEYWORDS: Academic procrastination, self-regulation of learning, prior knowledge, mathematical self-efficacy

ÍNDICE

Lista de Figuras

Lista de Tabelas

1. Introdução

"You may delay, but time will not"

Benjamim Franklin

"Never leave till tommorrow that wich you can do today"

Benjamim Franklin

A procrastinação é um comportamento de adiamento da realização de tarefas planeadas (Ferrari, 2001; Knaus, 1973; Milgram, Batori, & Mowrer, 1993). No campo da educação, este comportamento é conhecido como procrastinação académica e apresenta um impacto negativo no sucesso escolar dos alunos (Lowinger et al., 2016; Solomon & Rothblum, 1984; Sénecal, Koestner, & Vallerand, 1995; Tice & Baumeister, 1977; Wäschle, Allgaier, Lachner, Fink, & Nuckles, 2014). A literatura define procrastinação académica como o atraso ou adiamento do estudo e realização de tarefas escolares face a prazos estipulados (e.g., estudo diário, completamento dos TPC, estudo para os testes) (Ferrari, Johnson, & McCown, 1995; Sénecal et al., 1995; Steel, 2007). A investigação sobre o constructo de procrastinação académica apresenta duas linhas principais de investigação. Uma linha de investigação sugere que a procrastinação é resultante de um traço pessoal, uma disposição de personalidade estável (Lay, 1992; Lay & Silverman, 1996; Milgram & Raviv, 1992; Steel, 2007), enquanto que a outra considera a procrastinação como um estado situacional. Um comportamento resultante de influências ambientais que contribuem para a procrastinação dos alunos (Saddler & Buley, 1999; Schouwenburg, 1995; Wolters, 2003).

Por exemplo, existem estudos anteriores que reportaram que a procrastinação académica está associada a características da tarefa, dificuldades percebidas pelos alunos, bem como disfunções na autorregulação da aprendizagem (ARA) (Chu & Choi, 2005; DeRoma, et al., 2003; Ferrari, Parker, & Ware, 1992; Ferrari, 2001; Ferrari & Tice, 2000; Klassen & Kuzuku, 2009; Wolters, 2003). Para além disso, algumas investigações sugerem que os alunos procrastinam para dar lugar a alternativas mais atrativas e concorrentes. Um corpo robusto de investigação considera a procrastinação académica como um comportamento desadaptativo que se caracteriza pela redução do tempo do estudo (Bembenutty, 2001; Wäschle et al., 2014; Wolters, 2003), diminuição do domínio e retenção dos conhecimentos (Ferrari et al., 1995) e diminuição da quantidade e qualidade da aprendizagem (Klingsieck, Grund, Schmid, & Fries, 2013; Lay, 1992; Lay & Schouwenburg, 1993). A procrastinação académica tem sido vista como um comportamento frequente entre os alunos e a sua prevalência parece crescer ao longo dos anos de escolaridade (Kim & Seo, 2015; Rosário et al., 2009; Steel, 2007). Dada a relevância e

influência da procrastinação na vida académica dos alunos, parece-nos pertinente estudar a sua natureza e os fatores associados que podem ajudar a compreender o fenómeno junto da população estudantil moçambicana. Esta investigação responde à necessidade de realizar estudos nesta temática com adolescentes de culturas não ocidentais, uma vez que estas últimas não têm recebido a atenção dos investigadores (Klassen et al., 2009; Klassen & Kuzuku, 2009). Do nosso conhecimento, sabe-se que algumas variáveis (e.g., autoeficácia, autoeficácia para a aprendizagem autorregulada) estão negativamente associadas à procrastinação académica (e.g., Klassen & Kuzuku, 2009), porém pouco se sabe sobre o processo de procrastinação académica em adolescentes.

A compreensão do fenómeno da procrastinação académica na população estudantil moçambicana é premente. Este estudo visa recolher dados úteis para a prática educativa, nomeadamente para a formação de professores, que contribuam para o sucesso escolar dos alunos a matemática. Os nossos resultados permitem sugerir estudos futuros, bem como intervenções para diminuir a procrastinação académica.

1.1 Introdução aos estudos da presente tese

Os estudos da presente tese orientam-se na visão de que a procrastinação académica é um comportamento situacionalmente determinado de adiamento do estudo (Ferrari, 1998; Katz, Eilot, & Nevo, 2014; Schouwenburg, 1995; Wolters, 2003). O processo de procrastinação académica inicia quando o aluno é consciente de que adia o momento marcado para o estudo, para se envolver noutras tarefas (Bembenutty, 2011). Este comportamento pode dever-se à disfunção do processo autorregulatório (Sampaio, Polydoro & Rosário, 2012), com uma consequência na inadequada priorização de tarefas. Assim sendo, a presente tese, pretende ser uma reflexão sobre a procrastinação académica seguindo a perspectiva da autorregulação da aprendizagem, considerando que este marco teórico nos poderá ajudar na compreensão deste comportamento no contexto escolar (Wolters, 2003). A investigação sobre o guarda-chuva sociocognitivo da ARA sugere que os alunos que organizam e planificam o seu estudo, e usam as estratégias de ARA eficazmente são menos propensos à procrastinação académica (Wolters, 2003, Balkis & Duru, 2016; Rosário et al., 2009; Yerdelen, McCaffrey, & Klassen, 2016).

Tendo em conta a existência de um corpo robusto de evidências, incluindo uma recente meta-análise, podemos concluir que a procrastinação académica explica o desempenho e o rendimento dos

alunos, (e.g., Kim & Seo, 2015, Wäschle et al., 2014). A presente tese pretende explorar as variáveis e fatores que ajudam a explicar a procrastinação académica no domínio da matemática. Assim, pretendemos aprofundar e alargar o corpo de investigação sobre a procrastinação académica a matemática visando sugerir recomendações para a promoção de processos autorregulatórios.

A presente tese, constituída por dois estudos empíricos (um quantitativo e outro qualitativo), pretende dar respostas às lacunas identificadas no estado de arte, nomeadamente a necessidade de realizar estudos sobre a temática da procrastinação académica em adolescentes. O primeiro estudo, utilizando dados recolhidos junto de alunos e professores, analisa as variáveis que explicam a procrastinação académica (e.g., conhecimento prévio, autorregulação da aprendizagem) através de um modelo de equações estruturais (capítulo 1). Apesar dos importantes contributos deste estudo para a investigação e prática educativa, o modelo não explica totalmente a variância na procrastinação académica. Deste modo, surgiu a necessidade de analisar mais profundamente o processo de procrastinação académica a fim de encontrar outros fatores que podessem ajudar a compreender o fenómeno. Neste sentido, através de um estudo qualitativo (capítulo 2), explorámos os antecedentes da procrastinação académica, as tarefas nas quais os alunos procrastinam com frequência e o seu impacto percebido pelos adolescentes moçambicanos. Para compreender de forma profunda o processo, explorámos, ainda, as respostas dos professores perante os comportamentos de procrastinação dos seus alunos. Este estudo permitiu identificar novas nuances sobre o processo da procrastinação, o que complementa estudos quantitativos anteriores, tal como sugerido pela literatura (Katz et al., 2014; Klingsieck et al., 2013; Scraw, Wadkins, & Olafson, 2007). O último estudo revelou que o TPC é a tarefa em que os alunos reportam procrastinar mais, o que sugere a necessidade de aprofundar a investigação centrada na procrastinação nos TPC de matemática.

1.2 Porquê centrar os estudos na disciplina de matemática?

Os estudos da presente tese foram realizados com o propósito de centrar a investigação num domínio específico. A disciplina de matemática reveste-se de grande relevância na vida dos alunos no geral (González-Pienda et al., 2006; 2007) e no desenvolvimento profissional em particular (OECD, 2014). É uma disciplina que preocupa os alunos, investigadores, governantes e educadores (Hagger, Sultan, Hardcastle, & Chatzisarantis, 2015). A matemática é uma disciplina presente no currículo do ensino básico e do secundário geral (Baloğlu & Koçak, 2006) e o rendimento académico nesta disciplina

exerce uma forte influência nas crenças dos alunos sobre as suas capacidades no cálculo e nas futuras escolhas profissionais (Yu & Singh, 2016). Acresce ainda, no caso concreto de Moçambique, que segundo o Ministério da Educação e Desenvolvimento Humano (2015), os alunos do 10.º e 12.º ano percebem a matemática como uma disciplina difícil e obtiveram baixas pontuações no exame final.

1.3 Participantes dos Estudos

Os participantes dos estudos da presente tese são alunos adolescentes. Esta opção, foi tomada considerando que esta ênfase no ambiente educacional deve começar com jovens alunos, nas idades em que desenvolvem a sua autoeficácia, motivação, perceções académicas e comportamentos (Onatsu-Arvolommi, Nurmi, & Aunola, 2002). Os dados do capítulo 1, foram recolhidos junto a alunos do 10.º e 12.º anos. Neste estudo, foram também recolhidos com os professores de matemática, sobre o nível de procrastinação dos seus alunos. No estudo do capítulo 2 realizámos entrevistas a alunos e seus professores para explorar as perspetivas dos adolescentes moçambicanos em relação à procrastinação académica (e.g., razões, tarefas nas quais usualmente procrastinam e as consequências percebidas) e as respostas dos seus professores de matemática perante este tipo de comportamentos, uma vez que, por vezes, as atitudes dos professores parecem estar associadas à procrastinação académica dos alunos (Klingsieck et al., 2013). Acresce, ainda, o fato de que, muitos estudos sobre a procrastinação académica têm sido realizados maioritariamente com estudantes do ensino superior e menos têm analisado o comportamento de alunos do ensino secundário (e.g., Klassen et al., 2010; Wäschle et al., 2014), sendo necessário perceber que fatores podem influenciar a procrastinação académica em alunos adolescentes, incidindo especialmente nos anos de transição escolar (Katz et al., 2014).

Para colmatar estas lacunas na investigação desenvolvemos dois estudos no contexto do ensino moçambicano com alunos adolescentes, tal como referido anteriormente. Esta opção permitirá aprofundar o nosso conhecimento sobre os comportamentos de procrastinação no sistema educativo de Moçambique.

Assim sendo, o estudo empírico de natureza quantitativa foi realizado com alunos do 10.º e 12.º anos (capítulo 1). O estudo de natureza qualitativa que integra o capítulo 2, foi realizado com os alunos do 11.º e 12.º anos e seus professores de matemática. Esta opção possibilitou a compreensão mais aprofundada do processo, bem como a resposta dos professores face aos comportamentos de procrastinação académica dos seus alunos.

1.4 Metodologias de análise de dados

A presente tese adota metodologias de análise de dados diferentes nos dois estudos. No estudo do capítulo 1 de natureza quantitativa, recorremos à combinação do SPSS, versão 22 do programa IBM SPSS e o AMOS, seguindo um modelo SEM, cujo um dos principais objetivos é analisar as relações entre variáveis em simultâneo. De acordo com Byrne (1994) é uma técnica que revela vantagens sobre outras técnicas, tais como: (a) permite ter em conta que a variância é instável ao longo do tempo; (b) possibilita calcular os erros de medida (variáveis observadas) e (c) possibilita estimar, com rapidez, a significância estatística de cada efeito causal e o ajustamento global do modelo hipotético. Se o ajustamento global do modelo testado for adequado, aprovam-se as relações ou efeitos exibidos pelo modelo.

Por último, o capítulo 2 é um estudo qualitativo que visa compreender o significado que os participantes atribuem às suas experiências através de uma análise de conteúdo. Esta técnica permite a descrição, análise e interpretação do discurso dos participantes (Bardin, 1996, 1999).

CAPÍTULO 1

ACADEMIC PROCRASTINATION IN HIGH SCHOOL STUDENTS FROM MOZAMBIQUE: THE ROLE OF PRIOR KNOWLEDGE IN MATHEMATICS, SELF-REGULATED LEARNING, AND SELF-EFFICACY

2. Academic procrastination in high school students from Mozambique: the role of prior knowledge in mathematics, self-regulated learning, and self-efficacy

2.1 Abstract

Academic procrastination may be described as the delay of the completion of academic tasks. This behavior is pervasive among students from different grade levels and cultures, but the extant literature lacks research that is focused on non-western contexts. A structural equation model was run to analyze the relationships between prior knowledge in mathematics, self-regulated learning (SRL), and self-efficacy in mathematics as predictors of mathematics procrastination. The model was analyzed using two independent samples (calibration and validation). The first sample was used to fit the model and the second to analyze the consistency of the findings. One thousand Mozambican students from the 10th and 12th grades participated in the study. Results indicated that both SRL and self-efficacy in mathematics were positively explained by prior knowledge in mathematics. Moreover, self-efficacy in mathematics was found to be positively related with SRL, and both were negatively related with mathematics procrastination. The study discusses these findings as well as their consequences, possible educational implications, and suggestions for educational practice.

Keywords*:* prior knowledge, self-efficacy, self-regulated learning, academic procrastination, mathematics, structural equation model

2.2 Introduction

Academic procrastination may be described as the postponement of the completion of academic tasks (Steel, 2007). Previous studies indicate that academic procrastination implies engaging in alternative activities that are more appealing than education-related activities (Schouwenburg, 2004). A voluminous corpus of literature has been showing the serious impact academic procrastination has on school achievement (e.g., Balkis, Duru & Bulus, 2013; Kim & Seo, 2015); still the examination and

identification of variables that may help to explain academic procrastination has received less attention from researchers. The present study aims to contribute to the literature by analyzing the role of a set of motivational and instructional variables to explain procrastination.

2.2.1 Prior knowledge, self-regulated learning, and self-efficacy: effects on procrastination

Procrastinating school work is a dynamic behavior of which activities of a more entertaining nature are likely to replace academic tasks (Pychyl, Lee, Thibodeau, & Blunt 2000). Students who procrastinate their school work are likely to delay their task until the last possible moment (Dewitte & Schouwenburg, 2002). The time pressure resulting from academic procrastination can compromise punctuality, lower the quality of work, and negatively influence the overall academic performance (Van Eerde, 2003). In a recent study, Wäschleand and colleagues (2014) reported that procrastination, understood as the postponement of scheduled tasks, resulted in a reduction of the study time, low involvement in the task, and *dysfunctional use of learning strategies*. For example, prior research has indicated that many students struggle with learning distractors. These students frequently replace study tasks with more attractive alternatives, such as the engagement in social networks (e.g., Facebook, Twitter) (Klassen & Kuzuku, 2009; Klassen, Krawchuk, & Rajani, 2008).

2.2.2 Prior knowledge and procrastination

Ausubel, Novak and Hanesian (1978) highlighted that "the most important single factor influencing learning is what the learner knows already" (iv). Learning involves the reconstruction pre-existing knowledge and connecting it with new information (Shuell, 1988). Dochy and Alexander (1995) conducted a review on prior knowledge research and concluded that there is a lack of proper definitions for this concept. Researchers use a vast terminology when addressing similar constructs (e.g., background knowledge, pre-existing knowledge). In the present research, the authors follow Rumelhart (1980) who defined prior knowledge as the knowledge that acts as a ground basis for students as they build upon it and integrate novel information. Prior knowledge influences students' readiness to learn new concepts: students often rely on prior knowledge to understand new information (Shuell, 1988). A prior investigation

indicates that students who have more prior knowledge and display a better understanding of it are likely to self-regulate their behavior while learning new material; therefore, prior knowledge plays a key role in academic achievement (e.g., Song, Kalet, & Plass, 2016). For example, Dochy, Segers and Buehl (1999) showed that prior knowledge is strongly and positively associated with learning outcomes. Furthermore, Ferla, Valcke, and Cai (2009) found a positive association between prior knowledge and self-efficacy in mathematics. Acknowledging previous investigations, Shapiro (2004) alerted researchers to the importance of including a measure of prior knowledge in the research designs; disregarding the effects of prior knowledge may compromise the validity of findings.

2.2.3 Self-regulated learning and Procrastination

SRL may be characterized as the thoughts, feelings, and actions generated by students to accomplish goals related to studying and learning (Rosário et al., 2014; Zimmerman, 2008). Students likely to self-regulate their learning plan and systematically use a set of cognitive and metacognitive strategies (Van Eerde, 2003; Wolters, 2003) to meet self-set goals (Rosário et al., 2010; Valle et al., 2015). Academic procrastination leads to a delayed start, a dysfunctional use of learning strategies (e.g., time management) (Ferrari, 2001), and, consequently, a poor performance or reduction of academic performance (Kim & Seo, 2015).

The processes of self-regulation and procrastination have been studied together because procrastination behaviors may arise from dysfunctions in the SRL process (Ferrari, 2001; Klassen, Krawchuk, & Rajani, 2008; Steel, 2007). Students who practice self-regulation skills while learning tend to evaluate the relationship between the use of learning strategies and the outcomes, and they display an active agent role (Zimmerman, 2008). These students are also likely to reflect on their own learning process and monitor their progress (Núñez, Rosário, Vallejo, & González-Pienda, 2013). Conversely, students who procrastinate their school tasks are likely to struggle if they attempt to use SRL strategies, and they tend to show poor time management (Lay & Schouwenburg, 1993; Wolters, 2003). These factors are expected to negatively affect the academic outcomes.

2.2.4 Self-efficacy and procrastination

Academic self-efficacy is a key motivational variable in the learning process; it may be defined as the judgments students have regarding their ability to execute tasks and achieve school goals (Bandura, 1986). As one would predict, these beliefs strongly influence students' motivation and behavior, as well as self-regulation, thus contributing to their level of academic success (Zuffianò et al., 2013). Importantly, students displaying positive perceptions regarding their success in school are likely to develop confidence when using SRL strategies, engage in learning, and make efforts to succeed (Núñez et al., 2013). Academic self-efficacy may be understood as a mediator in the relationship between SRL and academic performance (Zimmerman, Bandura, & Martinez-Pons, 1992). This characteristic is likely to influence students' school choices (e.g., task management), their effort and persistence to engage in school related tasks (e.g., complete homework), and their emotional reactions regarding school work (Olani, Harskamp, Hoekstra, & van der Werf, 2010). Thus, students holding positive motivational beliefs, such as a robust self-efficacy and a strong will for engaging in learning, are expected to self-regulate their learning effectively and achieve success (Rosário et al, 2014). This proposition is consistent with recent findings that show that self-efficacious students are likely to show low levels of procrastination (Wäschle et al., 2014); these findings also suggest that enhancing academic self-efficacy could be a key starting point in educators endeavour to reduce academic procrastination.

2.3 The present study

Extant research has examined the relationships between academic procrastination and school achievement (e.g. Howell & Watson, 2007; Wäschle et al. 2014; Wu & Fan, 2016). While academic procrastination helps explain academic performance, there is a growing need to deepen the understanding of the variables that could underlie this behavior (Klassen & Kuzuku, 2009; Klassen et al., 2009). However, to the best of authors' knowledge, only a few studies have examined these variables. Hence, the current study aims to further understand the roles that prior knowledge, SRL, and academic self-efficacy may play in academic procrastination. A structural equation model (SEM) was used to examine the relationships between these variables.

Academic procrastination is a pervasive behavior among students of all ages. Still, little is known about academic procrastination among high school students (Klassen & Kuzuku, 2009; Klassen et al.,

2009). Moreover, despite procrastination being a universal phenomenon, there are not many studies that have covered this issue among non-western cultures. There is a significant lack of literature that covers African educational context. Examining the cultural and societal characteristics of non-western countries may help further understand the academic procrastination process. For this reason, the present study was conducted with Mozambican adolescents. The Mozambican educational system presents feature that may promote the process of academic procrastination. For example, below the 10th grade, students pass the school subjects and progress in the school system despite not having reached the minimal grade (10 out of 20). This educational policy for "zero retention" below the 10th grade (high school), allows for students to advance throughout schooling even if they fail to meet the standards of knowledge needed to cope with high school demands.

While this study hones in on the Mozambican culture, it also focuses on mathematics. Procrastination behaviors displayed in this educational scenario is likely to pose serious academic challenges. Mathematics holds close relationships with other subjects (e.g., Chimestry, Biology) and is very important for professional development (e.g., see Baloğlu & Koçak, 2006; Hagger, Sultan, Hardcastle, & Chatzisarantis, 2015; OECD, 2014). While mathematics is a highly important subject, according to the Mozambican Ministry of Education and Human Development report (2015), students perceive it as the most difficult subject in high school, and they show low scores on the final high school exam.

The present study fitted a SEM using two independent samples of high school students. The first sample (calibration) was used to fit the model and the second (validation) was used to confirm the fit of the model. The SEM examined the relationships between prior knowledge, self-efficacy in mathematics, the use of SRL strategies and the procrastination in mathematics (see Figure 1). The model hypothesized (see Figure 1) that the more the prior knowledge, the more the self-efficacy and the use of SRL strategies; consequently, the less the academic procrastination.

2.4 Method

2.4.1 Participants

Participants were 1000 public high school students (in the 10th and the 12th grades) in the city of Maputo. Of this pool, 576 (57.6%) were 10th grade students and 571 (57.1%) were boys. The calibration

and validation samples comprised 500 students each. Regarding the calibration sample, participants were 289 (57.8%) boys and 211 (42.2%) girls, being 299 (59.8%) enrolled in the 10th grade and 201 (40.2%) in the 12th grade. Regarding the validation sample, participants were 280 (56.0%) boys and 220 (44.0%) girls, being 293 (58.6%) enrolled in 10th grade and 207 (41.4%) in the 12th grade. Finally, of the 15 mathematics teachers of these students, 9 were male (60%), and they had an average of 10.4 years of teaching experience (*SD*= 5.22).

2.4.2 Instruments and Measures

Self-regulated learning.

SRL strategies reported by students*.* To acess SRL strategies was used the SRL inventory (Rosário et al., 2010; Rosário et al., 2015). This instrument is a 9-item questionnaire that assesses the three phases of the SRL process: *Planning* (e.g., "I make a plan before I begin writing. I think about what I want to say and how I need to write it."), *Execution* (e.g., "If I become distracted or lose concentration while I am in class or studying, then I usually try to regain my concentration to achieve my goals."), and *Evaluation* (e.g., "I compare the grades I receive with the goals I set for that subject."). The students rated the items on a 5-point Likert scale ranging from 1 (*never)* to 5 (*always)*. Cronbach's alpha of the total scale was .86.

Students SRL strategies reported by teachers. The teachers answered the same questionnaire on SRL strategies for each of their participating students. Cronbach's alpha of the total scale was .82.

Self-efficacy in mathematics. Following Bandura's (2006) guidelines for constructing self-efficacy scales, the current study phrased the 10 items to assess the Mozambican students'perception of their skills in real numbers and geometry (e.g., "I know how to *find the* coordinates on the *centroid* of a *triangle* given the coordinates of the three vertices") (see Rosário et al., 2015). To adjust the items to the mathematics contents already delivered, a team of mathematics teachers (i.e., one faculty member from the Mathematics Department and two 10th and 12th grades school teachers) helped the researchers phrase the items. The final list of items was evaluated by three experts, and the general diagnostic reliability, $\kappa = .91$ ($p < .001$), was rated as excellent according to Landis and Koch (1977). Students ranked the items on a scale from 1 (*not at all true*) to 5 (*completely true*) (Cronbach's $\alpha = .89$).

Academic Procrastination in mathematics.

Academic Procrastination perceived by the student. Academic procrastination was assessed through a questionnaire by Rosário et al. (2009). This questionnaire is comprised of 10 items: five of which assess procrastination in daily study (e.g., "I am up-to-date in my studies because I work every day"), and the other five assess procrastination in studying for tests (e.g., "When I study for exams, I'm often absent minded"). Students responded to the items on a scale from 1 (*never*) to 5 (*always*). (Cronbach's α = .79).

Students' behavioral academic procrastination. Following the studies of DeWitte and Schouwenburg (2002) and Krause and Freund (2014), the researchers asked the students to report the amount of time they had planned to study in the past 24 hours and the actual amount of time spent studying in that time frame. Behavioral procrastination was calculated by subtracting the actual time spent from the time planned to study. Finally, a variable with four levels of procrastinated time was computed: 1 stands for no time differences; 2 stands for an amount of time between 1 and 15 minutes, 3 stands for an amount of time between 16 and 30 minutes, and 4 stands for a time difference of more than 30 minutes.

Teachers' perception of students' academic procrastination. The teachers rated their students' procrastination based on the behavior they observed in class. Four items of the questionnaire by Rosário et al. (2009) that filled in by the students were adapted to be rated by the teachers (e.g., "When I propose a task to do in class, (name of the student) starts doing it immediately"). The teachers responded on a scale from 1 (*never*) to 5 (*always*). (Cronbach's α = .77).

Prior knowledge in mathematics. The students' prior knowledge in mathematics was obtained from student's grades on the previous year. Data were collected in the schools' secretariat. In Mozambican education, grades range from 1 to 20 with 10 accepted as a passing grade.

2.4.3 Procedure

The district education director in the city of Maputo authorized the study. Afterwards, the research team contacted the directors of the two largest high schools in the city of Maputo and invited them to participate in the research. The boards from both schools agreed to participate, and in each school, 10th and 12th grade classes were randomly selected. The majority of these students' parents authorized the participation of their children in the study (response rate of 90%). The questionnaires were given to the students of each class simultaneously, and the students were allowed 20 minutes to complete them. The

students and the teachers responded to the questionnaires voluntarily after being informed about the purposes of the study and the guarantee of confidentiality regarding the data.

2.4.4 Data analysis

The model was fit with the SEM using AMOS 22 software (Arbuckle, 2012). First, the data matrix (calibration and validation samples) was analyzed to determine whether there were any values that violated any of the assumptions required for the use of the SEM (e.g., multivariate normality, linear relations among variables, and absence of multicolinearity) or whether there were any missing data or outliers. Subsequently, the calibration sample allowed for the examination of the fit of the model. To cross-validate the results, the model was also fitted in an independent sample of students (validation sample). Finally, a multigroup analysis was conducted to examine the level of invariance in the parameters of the model fit for both samples. This strategy allowed the researchers to understand the extent of the results that were obtained in the first sample replicated in the second; because of this strategy, the researchers were able to determine the degree of the results' replicability and validity.

2.5 Results

2.5.1 Descriptive analysis

Table 1 presents the descriptive statistics and Pearson's correlations corresponding to the calibration and validation samples. Before the statistical analysis was carried out, the matrices were checked for missing values and the presence of outliers, linearity, and normality. In addition, the SEM analysis requires that the variables taken should follow a normal distribution. Because the maximum likelihood (ML) can produce a distortion when the assumption of normality is violated (West, Finch & Curran, 1995), the distribution of variables (kurtosis and skewness) was examined. Considering the criterion of Finney and DiStefano (2006), in which 2 and 7 are identified as the maximum permissible values for skewness and kurtosis, all variables comply with the criteria (see Table 1). Thus, the model was fit using the ML.

Table 1. *Correlations matrix corresponding to the variables included in the model (calibration sample and validation sample) and descriptive values [mean (*M*), standard deviation (*SD*), skewness and kurtosis].*

	1	2	3	4	5	6	7
1. PK in math's	-	.409**	.367**	.414**	-.253**	-.240**	-.281**
2. Self-efficacy in math's	.525**	-	.271**	.320**	-.301**	-.210**	-.294**
3. SRL-s	.415**	.332**	-	.650**	-.317**	-.375**	-.414**
4. SRL-t	.436**	.407**	.735**	-	-.356**	-.321**	-.404**
5. BAP	-.265**	-.237**	-.276**	-.290**	-	.398**	.469**
6. APM-s	-.337**	-.292**	-.445**	-.421**	.378**	-	.562**
7. APM-t	-.346**	-.357**	-.408**	-.442**	.411**	.618**	-
Calibration sample							
M	11.69	2.40	3.53	3.49	2.55	2.93	3.20
SD	2.453	.705	.661	.575	.757	.954	.787
Skewness	.000	.737	-.271	-.217	-.017	.025	-.141
Kurtosis	.433	.165	-.213	.374	-.342	-.668	-.277
Validation sample							
M	11.40	2.22	3.52	3.45	2.58	2.92	3.21
SD	2.557	.713	.625	.585	.767	.914	.748
Skewness	-.115	.384	-.457	-.171	.037	.075	-.130
Kurtosis	1.224	.167	.393	.861	-.403	-.424	-.184

Legend: The correlations, for the validation sample are represented above the diagonal and the correlations for the calibration sample below the diagonal; 1. (PK in math's) Prior Knowledge in Mathematics; 2. (Self-efficacy in Maths) Self-Efficacy in Mathematics; 3. (SRL-s) SRL reported by students; 4. (SRL-t) students SRL reported by teacher; 5. (BAP) Behavioral Academic Procrastination; 6. (APM-s) Academic Procrastination in mathematics reported by students; 7. (APM-t) Students' Academic Procrastination in mathematics reported by teachers.

Data was examined to determine whether any of the variables or subjects had a significant amount of missing data. Fifty-four students (30 from the 10th grade) were eliminated from the matrix. The final sample was comprised of 1000 students and their 15 teachers. Following the recommendations of Kline (2010), the authors concluded that none of the variables had a significant number of missing values.

2.5.2 The relationship between prior knowledge in mathematics, mathematics self-efficacy, self-regulation learning, and academic procrastination in mathematics

Calibration Sample Analysis. In the first evaluation of the model, the estimated parameters showed the expected magnitude and sign (consistent with the theory underlying the model); no

excessively large or small standard errors were found (Bentler, 1995). The data indicated that the fit of the hypothetical model for the data matrix was acceptable, $\chi 2$ (11) = 18,483; $\chi 2$ / df = 1,680; $p > .05$; GFI = .989; AGFI = .973; CFI = .994; and RMSEA = .037 (LO90=.000, HI90=.065). Regarding the criteria used to judge the goodness of fit indices, the hypothetical model represents the relations of the empirical data matrix optimally.

Data indicated that all the estimated parameters were statistically significant (see Table 2). As predicted, math prior knowledge was positively related with SRL (.380) and mathematics self-efficacy (.525). Mathematics self-efficacy was positively related with SRL (.237) but negatively with math procrastination (-.174). Finally, SRL was strong and negatively associated with procrastination in mathematics (-.567). Moreover, data indicated that 30% of the reported use of SRL strategies variance, 28% of the mathematics self-efficacy variance, and 44% of the procrastination in mathematics variance was explained.

Table 2. Standardized regression weights for measurement and structural parts of hypothetical model: Results of calibration sample (CS) and validation sample (VS)

	Coefficients		SE		CR	
	CS	VS	CS	VS	CS	VS
Structural model						
PK in math's →SRL	.380	.405	.010	.009	7.603	8.081
Self-Efficacy in math's → SRL	.237	.203	.035	.033	4.775	4.129
PK → Self-efficacy in math's	.525	.409	.011	.011	13.792	10.007
Self-efficacy in math's →AP in math's	-.174	-.159	.028	.032	-3.447	-3.199
...SRL→AP in math's	-.567	-.586	.056	.068	-7.786	-8.284
Measurement model						
AP in math's→ APM-s	.764	.683	.187	.122	10.130	11.019
AP in math's →BAP	.508	.603	-	-	-	-
AP in math's → APM-t	.805	.799	.161	.112	10.203	11.524
SRL→SRL-s	.835	.791	.063	.073	17.399	14.158
SRL→SRL-t	.877	.821	-	-	-	-

Legend: *SE*=standardized errors, *CR*=critical ratio, *p*=probability, structural model (relation between the independent and the dependent variables in the model), ᵃ measurement model (relation between the latent variables in the model and the observed variables).

1. (PK in math's) Prior Knowledge in Mathematics; 2. Self-Efficacy in mathematics; 3. (SRL-s) SRL reported by students; 4. (SRL-t) students SRL reported by teacher; 5. (BAP) Behavioral Academic Procrastination; 6. (APM-s) Academic Procrastination in mathematics reported by students; 7. (AP-t) Students' Academic Procrastination in mathematics reported by teachers.

All the coeficients are statistically significant at $p < .001$

Considering the goodness of fit of the model and the confirmation of the predictions, the SEM was found to be adequate for explaining the relationship of the data matrix. Having confirmed all the

hypotheses, an independent sample was studied to examine the consistency of data in the calibration model.

2.5.3 Validation Sample Analysis

The estimated parameters for this second sample of students show the estimated magnitudes and signs and the standard errors are not excessively large or small (see Table 1). Similarly, to the calibration sample, the goodness of fit of the hypothesized model was acceptable, $\chi 2$ (11) = 16,894; $\chi 2$ / df = 1,536; $p > .05$; GFI = .990; AGFI = .974; CFI = .994; RAMSEA = .033 (LO90=.000, HI90=.062). Similar to the calibration sample, the model was found to be appropriate.

In regards to the predictions of the model, findings are aligned to those of the calibration sample with only small variations in the magnitude of the statistics obtained (see Table 2). The explanation for the variance of the model's three dependent variables is similar to that of the calibration sample. However, to consider the small variations in both studies, a multigroup analysis was conducted to examine whether the hypothesized model is similar in both samples.

2.5.4 Multigroup Analysis

The multigroup analysis consists of comparing the fitness of the nested models that complete the analysis once one of the models is rejected. Specifically, the similarity of the nested models in both samples regarding their five dimensions was tested: measurement weights, structural weights, structural covariances, structural residuals, and measurement residuals. Table 3 shows the results of the fit of the five models (as well as Independence and Unconstrained models).

Table 3. Nested model fit summary

	[1]*IM*	[2]*U*	[3]*MW*	[4]*SW*	[5]*SC*	[6]*SR*	[7]*MR*
χ^2	2233.958	35.377	42.233	49.351	50.202	54.717	64.351
Df	42	22	25	30	31	34	39
χ^2/df	53.189	1.608	1.689	1.645	1.619	1.609	1.650

P	.000	.035	.017	.014	.016	.014	.006
GFI	.514	.990	.988	.986	.986	.985	.982
AGFI	.352	.974	.973	.974	.975	.975	.974
CFI	.000	.994	.992	.991	.991	.991	.988
RMSEA	.229	.025	.026	.025	.025	.025	.026

[1]Independence Model, [2]Unconstrained model, [3]Measurement Weights, [4]Structural Weights, [5]Structural Covariance, [6]Structural Residuals, [7]Measurement Residuals).

The results showed that the hypothesized model is similar in both samples in which the five criteria were examined. All five models presented excellent fit indexes. In this evaluation and in a nested model comparison strategy, while assuming that the unconstrained model is similar in both groups, the equality of the measurement weights was tested: i) no statistically significant differences were found, $\Delta\chi^2(3) = 6.856$, $p = .077$, NFI = .003, IFI = .003, RFI = .002, TLI = .002; ii) assuming that there were no differences in measurement weights, no statistically significant differences were observed in structural weights, $\Delta\chi^2(5) = 7.118$, $p = .212$, NFI = .003, IFI = .003, RFI = -.001, TLI = -.001; iii) assuming the absence of differences in structural weights, no statistically significant differences were found in structural covariances, $\Delta\chi^2(1) = .851$, $p = .356$, NFI = .000, IFI = .000, RFI = .000, TLI = .000; iv) assuming the absence of differences in structural covariances, no statistically significant differences were found in structural residuals, $\Delta\chi^2(3) = 4.515$, $p = .211$, NFI = .002, IFI = .002, RFI = .000, TLI = .000; and v) assuming the absence of differences in structural residuals, no statistically significant differences were found in measurement residuals, $\Delta\chi^2(5) = 9.633$, $p = .086$, NFI = .004, IFI = .004, RFI = .001, TLI = .001.

2.6 Discussion

The current research aimed to deepen the understanding about the academic procrastination process. To accomplish this goal, the relationships between prior knowledge, SRL, self-efficacy, and academic procrastination were examined, all in regards to mathematics. Previous studies have analyzed these relations (e.g., Wäschle et al., 2014), but few have used a SEM. Analyzing data with the SEM allowed the researchers to consider all direct and indirect effects between variables simultaneously, as

well as to present a detailed map of the existing relationships. Moreover, following the literature, the researchers used different methodologies (i.e. self-reports and behavioral measures) to identify the latent variables of SRL and academic procrastination in mathematics (see Krause & Freund, 2014) which were scored by different subjects (e.g., students and teachers responded to self-reports regarding the same behaviors). In addition, the researchers attempted to cross-validate the results of the analysis (calibration and validation) by examining the results with multigroup analysis using two homogeneous samples of students. The authors expect the findings from the current study to expand the knowledge regarding the relationships between possible variables that explain academic procrastination.

The main finding of the present study is that 44% of the variance of procrastination in mathematics was explained by SRL and self-efficacy in mathematics directly, and prior knowledge in mathematics indirectly (through SRL and self-efficacy in mathematics). Moreover, results of the SEM analysis showed a negative relationship between those variables and academic procrastination in mathematics. In general, these results are consistent with extant research (Wäschle et al, 2014; Wolters, 2003) that reported that academic procrastination is negatively associated with self-efficacy in mathematics and SRL. Furthermore, the results add to the literature by highlighting the important role of prior knowledge as it can help explain the students' reasons for procrastinate in mathematics.

The data from the current study confirms the hypotheses proposed in the model. First, strong relationships between prior knowledge in mathematics, SRL, and self-efficacy in mathematics were found. The data indicates that the more prior knowledge students have in mathematics, the more their use of SRL strategies and their sense of self-efficacy in mathematics (Figure 2 presents a synthesis of the results).

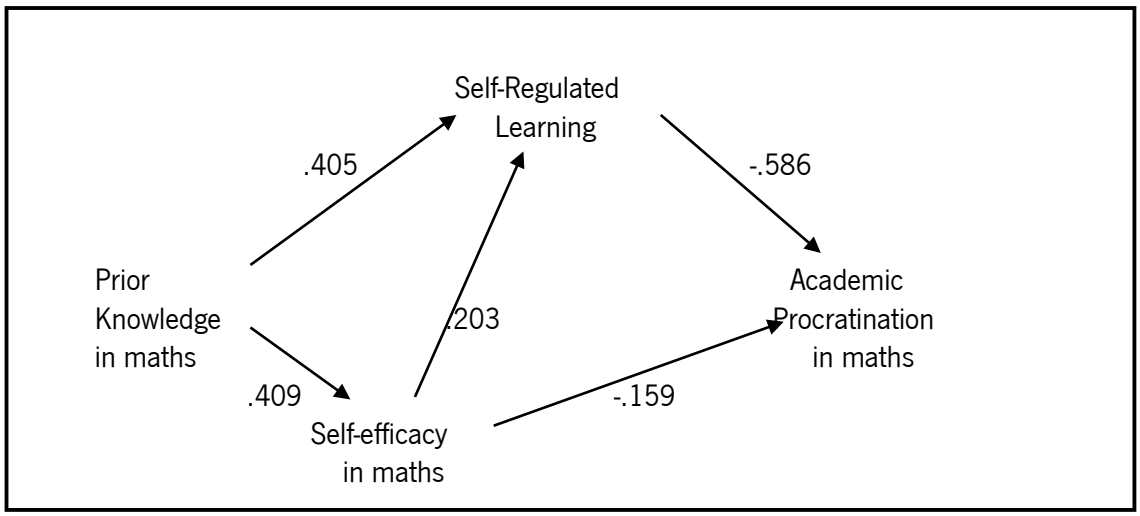

Figure 1. Predictors of academic procrastination: synthesis of the results of the hypothetical model.

These findings are consistent with the model proposed by Winne and Hadwind (2008) as they emphasize the key role of prior knowledge in SRL. The findings also align with the data provided by Olani and colleagues (2010) who found that students' self-efficacy beliefs were related to the acquisition of statistical reasoning abilities. Moreover, the data indicated that SRL and academic procrastination were negatively associated: the more the students self-regulate their learning, the less likely they are to procrastinate their involvement in mathematics tasks. This finding is consistent with extant literature (e.g., Balkis & Duru, 2016; Rosário et al., 2009; Yerdelen, McCaffrey, & Klassen, 2016). Furthermore, the data indicated a negative relationship between self-efficacy in mathematics and academic procrastination in mathematics: the higher the students' self-efficacy, the lower their academic procrastination. This latter finding is consistent with the recent studies that indicated that students who hold a strong self-efficacy are likely to show low levels of academic procrastination (Lowinger et al., 2016; Wäschle et al., 2014; Wu & Fan, 2016). The use of SRL strategies was positively related to self-efficacy in mathemattics; the more the students self-regulate their learning, the better their sense of self-efficacy in mathematics. This finding is consistent with prior research relating to academic self-efficacy and SRL (Rosário, Núñez, Valle, González-Pienda, & Lourenço, 2013; Schunk & DiBenedetto, 2016).

The findings of the current study contain important educational implications. Educators and school administrators could consider analyzing the educational implications of the data and translate the findings into classroom practices. Students with more prior knowledge in mathematics are likely to develop a stronger sense of self-efficacy in mathematics (Peklaj, Podlesek & Pečjak, 2015; Wäschle et al., 2014), engage more in SRL processes, and invest more energy in school tasks; they are also less likely to show procrastination behaviors (Balkis & Duru, 2016; Klassen & Kuzuku, 2009). The data of the present study set a ground for claiming prior knowledge as a variable of the explanation for academic procrastination in mathematics. The findings of the current study are of special relevance due to the "zero retention" policy followed by the Mozambican Educational system. Mathematics is a school subject organized as a spiral curriculum: the learning topics taught in the early grades set the ground for the content to be taught in the following years. The basic topics of the curriculum are revisited throughout schooling to assure a deep understanding of contents that will last up through the later grades (OECD, 2014). Students lacking this important prior knowledge and the skills needed to cope with the growing educational challenges throughout schooling are expected to show poor school outcomes. In fact, prior research has indicated that prior knowledge influences how students interpret and understand new material (Shuell, 1988).

Educators and school administrators could consider organizing school-based sessions to assist students in catching up content knowledge. Literature presents examples of good practices that could be

considered by educators (e.g., catch up classes, catch up days or mentoring programs) for students lacking prior knowledge. For example, catch up activities are focused on providing opportunities to help students improve their grades by completing missing assignments, finishing essays, or working on deficient skills (Warsame, Mortensen, & Janif, 2014). Another strategy could be to deliver mentoring sessions to teach students effective learning strategies while monitoring their progress (Núñez, et al., 2013; Rosário et al., 2016). These school-based interventions could foster students' involvement in learning, promote their SRL processes, increase their self-efficacy, and reduce their procrastination behaviors (Balkis & Duru, 2016; Klassen & Kuzuku, 2009).

2.7 Limitations and Future Studies

Despite the promising results, the implications should be examined with caution, as the study is not without limitations. The model proposed to explain academic procrastination is of merit as it includes theoretically relevant variables related with academic achievement (i.e. prior knowledge in mathematics, SRL, and self-efficacy in mathematics). Moreover, the latent variables in the model (i.e. SRL and procrastination in mathematics) were built upon data collected from different subjects (i.e. information regarding the same construct was gathered from students and teachers) and using distinct data collection methods (i.e. questionnaires, behavioral measures). However, there is an important proportion of unexplained variance in the model, so future studies could consider broadening the variables to be included. Researchers could consider including variables such as the students' confidence in prior knowledge (judgment on the correctness of ones' understanding of the topic) (Cordova, Sinatra, Jones, Taasoobshirazi, & Lombardi, 2014) and the perceived usefulness of mathematics. The latter, for example, could help further understand the phenomenon of academic procrastination because the perceived usefulness of mathematics in students' future decreases throughout schooling (Ramirez, Gunderson, Levine, & Beilock, 2013).

Future studies could also analyze procrastination behaviors on a broader scale. Some studies could investigate the procrastination of mathematics homework and its role as a predictor. Prior investigation has highlighted homework as a key tool for the development of SRL as well as for promoting positive attitudes towards studying (Núñez et al., 2015; Rosário et al., 2015). The procrastination of homework tasks, however, may be a symptom of a more general tendency to procrastinate school activities, which may grow throughout schooling. In addition, future research could consider investigating procrastination

behaviors within different grade levels (Katz, Eilot & Nevo, 2014), starting in elementary school contexts where children are expected to develop positive attitudes and habits towards school work.

The current study did not conduct multilevel analysis. The number of classes were not sufficient (clearly less than 50), so authors decided to analyze data with two independent samples: the first used to fit the model and the second to confirm the model fit. Despite the promising results, future studies should consider the possibility of conducting a multilevel study to account for the hierarchical nature of the data.

Due to the cross-sectional nature of this study, no causal inferences are allowed, even under the SEM perspective. Future studies could consider adopting a repeated measures design so that data can be collected multiple times and information regarding causes and effects and the potential reciprocal relations can be obtained from the variables included in the model.

The current research used self-reported and behavioral measures, the latter still self-reported, to assess academic procrastination. To further investigate the phenomenon, future studies could consider collecting qualitative data. As Krause and Freund (2014) recently alerted, self-reported and behavioral measures may capture the delay component of the procrastination behavior, but they are likely to miss the affective components of procrastination. The data gathered from interviews of high and low academic procrastinators are expected to shed light on this affective component (e.g., emotional discomfort, fear of failure, negative affect) and help with the understanding of the complex phenomenon of procrastination.

2.8 Conclusions

The findings of the present study highlight a cycle of relationships between prior knowledge in mathematics, the use of SRL strategies, and the students' sense of self-efficacy in mathematics. The current data may help school administrators and educators building effective educational practices in classroom. As the ancient Mozambican proverb says, "a snake that you can see does not bite".

2.9 References

Arbuckle, J. L. (2012). IBM SPSS AMOS 21 User´s Guide. Chicago: Smallwaters Corporation.

Ausubel, D., Novak, J.D. & Hanesian, H. (1978). Educational Psychology: A cognitive view. 2nd Edition. New York: Holt, Rinehart & Winston.

Balkis, M., & Duru, E. (2016). Procrastination, self-regulation failure, academic life satisfaction, and affective well-being: underregulation or misregulation form. *European Journal of Psychology of Education*, 31, 439-459.

Balkis, M., Duru, E., & Bulus, M. (2013). Analysis of the relation between academic procrastination, academic rational/irrational beliefs, time preferences to study for exams, and academic achievement: a structural model. *European Journal of Psychology of Education*, *28*, 825-839. doi:10.1007/s10212-012-0142-5

Baloğlu, M., & Koçak, R. (2006). A multivariate investigation of the differences in mathematics anxiety. *Personality and Individual Differences, 40*, 1325-1335.

Bandura, A. (1986). Social foundation of thought and action: A Social cognitive theory. Eaglewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), Adolescence and education: Vol. 5. Self-efficacy and adolescence (pp. 307–337). Greenwich, CT: Information Age.

Bentler, P. M. (1995). EQS: structural equations program manual. Encino: Multivariate Software.

Cordova, J., Sinatra, G., Jones, S., Taasoobshirazi, G., & Lombardi, G. (2014). Confidence in prior knowledge, self-efficacy, interest and prior knowledge: Influences on conceptual change. *Contemporary Educational Psychology*, *39*, 164–174.

Dewitte, S., & Schouwenburg, H. (2002). Procrastination, temptation and incentives: the struggle between the present and the future in procrastination and the punctual. *European Journal of Personality*, *16*, 469-489.

Dochy, F., Segers, M., & Buehl, M. M. (1999). The relation between assessment practices and outcomes of studies: The case of research on prior knowledge. *Review of Educational Research*, *69*, 145–186.

Dochy, F.J.R.C. & Alexander, P. A. (1995). Mapping prior knowledge: A framework for discussion among researchers. *European Journal of Psychology of Education, 5*, 225–242.

Ferla, J., Valcke, M., & Cai, Y. (2009). Academic self-efficacy and academic self-concept: Reconsidering structural relationships. *Learning and Individual Differences*, *19*, 499-505.

Ferrari, J. (2001). Procrastination as Self-Regulation Failure of Performance: Effects of Cognitive Load, Self-awareness, and Time Limits on "Working best under pressure", *European Journal of Personality, 15*, 391-406.

Finney, S. J., & DiStefano, C. (2006). Non-normal and categorical data in structural equation modelling. In G. R. Hancock & R. O. Mueller (Eds.), Structural equation modelling: a second course (pp. 269–314). Greenwich: Information Age Publishing.

Hagger, M. S., Sultan, S., Hardcastle, S. J., & Chatzisarantis, N. L. (2015). Perceived autonomy support and autonomous motivation toward mathematics activities in educational and out-of-school contexts is related to mathematics homework behavior and attainment. *Contemporary Educational Psychology*, *41*, 111-123. doi:org/10.1016/j.cedpsych.2014.12.002

Howell, A. J., & Watson, D. C. (2007). Procrastination: Associations with achievement goal orientation and learning strategies. *Personality and Individual Differences*, *43*, 167-178. doi.org/10.1016/j.paid.2006.11.017

Katz, I., Eilot, K., & Nevo, N. (2014). "I'll do it later": Type of motivation, self-efficacy and homework procrastination. *Motivation and Emotion*, *38*, 111-119. doi: 10.1007/s11031-013-9366-1.

Kim, K. R. & Seo, E. H. (2015). The relationship between procrastination and academic performance: A meta-analysis. *Personality and Individuals Differences, 82*, 26-33. doi: 10.1016/j.paid.2015.02.038.

Klassen, R. M, Krawchuk, L. L. & Rajani, S. (2008). Academic Procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology, 33*, 915-931.

Klassen, R. M., & Kuzuku, E. (2009). Academic procrastination and motivation of adolescents in Turkey. *Educational Psychology, 29*, 69-81. doi: 10.1080/01443410802478622.

Klassen, R. M., Ang, R. P., Chong, W. H., Krawchuk, L. L., Huan, V. S., Wong, I. Y F, & Yeo, L. S. (2009). A cross-cultural study of adolescent procrastination. *Journal of Research on Adolescence, 19,* 799-811.

Kline, R. B. (2010). *Principles and practice of structural equation modeling*. New York: Guilford Press.

Krause, K. & Freund, A. (2014). Delay or procrastination – A comparison of self-report and behavioral measures of procrastination and their impact on affective well-being. *Personality and Individual Differences*, *63*, 75-80. doi.org/10.1016/j.paid.2014.01.050.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174.

Lay, C. H., & Schouwenburg, H. C. (1993). Trait procrastination, time management, and academic behavior. *Journal of Social Behavior and Personality*, *8*, 647-622.

Lowinger, R. J., Kuo, B. C., Song, H. A., Mahadevan, L., Kim, E., Liao, K. Y. H., Chang, C. Y., Kwon, K., & Han, S. (2016). Predictors of Academic Procrastination in Asian International College Students. *Journal of Student Affairs Research and Practice*, *53*, 90-104. doi: 10.1080/19496591.2016.1110036.

Milgram, N., Sroloff, B., & Rosenbaum, M. (1988). The procrastination in everyday life. *Journal of Research in Personality, 22*, 197-212.

Ministério da Educação e Desenvolvimento Humano (2015). Baixo Desempenho nos Exames Finais: Relatório de Inquérito. Moçambique.

Núñez, J. C., Suárez, N., Rosário, P., Vallejo, V., Cerezo, R., & Valle, A. (2015). Teachers' Feedback on Homework, Homework-Related Behaviors, and Academic Achievement. *The Journal of Educational Research*, *108*, 204-216, DOI: 10.1080/00220671.2013.878298.

Núñez, J., Rosário, P., Vallejo, G., & González-Pienda, J. (2013). A longitudinal assessment of the effectiveness of a school-based mentoring program in middle school. *Contemporary Educational Psychology*, *38*, 11–21.doi.org/10.1016/j.cedpsych.2012.10.002.

OECD (2014). *Education at a Glance 2014: OECD Indicators*, OECD Publishing. http://dx.doi.org/10.1787/eag-2014-en.

Olani, A., Harskamp, E., Hoekstra, R., & van der Werf, G. (2010). The roles of self-efficacy and perceived teacher support in the acquisition of statistical reasoning abilities: a path analysis. *Educational Research and Evaluation*, *16*, 517-528, DOI: 10.1080/13803611.2011.554742

Peklaj, C., Podlesek, A., & Pečjak, S. (2015). Gender, previous knowledge, personality traits and subject-specific motivation as predictors of students' math grade in upper-secondary school. *European Journal of Psychology of Education*, *30*, 313-330.

Pychyl, T. A., Lee, J. M, Thiboudeau, R., & Blunt, A. (2000). Five days of emotion: an experience sampling study of undergraduate student procrastination. *Journal of Social Behavior and Personality, 15*, 239-254.

Ramirez, G., Gunderson, E. A., Levine, S. C., & Beilock, S. L. (2013). Math anxiety, working memory, and math achievement in early elementary school. *Journal of Cognition and Development*, *14*(2), 187-202. doi.org/10.1080/15248372.2012.664593

Rosário P., Núñez J.C., Vallejo G., Cunha J., Azevedo, R., Nunes, A.R., Fuentes, S., & Moreira, T. (2016). Promoting Gypsy children school engagement: A story-tool project to enhance self-regulated

learning. *Contemporary Educational Psychology, 47,* 84-94*. doi:* 10.1016/j.cedpsych.2015.11.005

Rosário P., Núñez J.C., Vallejo G., Cunha J., Nunes T., Suárez N., Fuentes S., & Moreira T. (2015). The effects of teachers' homework follow-up practices on students' EFL performance: a randomized-group design. *Frontiers in Psychology*, *6*, 1-11. doi: 10.3389/fpsyg.2015.01528

Rosário, P., Costa, M., Núñez, J. C., González-Pienda, J., Solano, P., & Valle, A. (2009). Academic Procrastination: Associations with Personal, School and Family Variables. *The Spanish Journal of Psychology, 12*, 118-127. doi: 10.1017/S1138741600001530.

Rosário, P., Núñez, J. C., González-Pienda, J. A., Valle, A., Trigo, L., & Guimarães, C. (2010). Enhancing self-regulation and approaches to learning in first-year college students: a narrative-based programs assessed in the Iberian Peninsula. *European Journal of Psychology of Education, 25*, 411–428.

Rosário, P., Núñez, J. C., Trigo, L., Guimarães, C., Fernández, E., Cerezo, R., Fuentes, S., Orellana, M., Santibáñez, A., Fulano, C., Ferreira, A., & Figueiredo, M. (2014). Transcultural analysis of the effectiveness of a program to promote self-regulated learning in Mozambique, Chile, Portugal, and Spain. *Higher Education Research and Development*, *34*, 173-187. doi:10.1080/07294360.2014.935932.

Rosário, P., Núñez, J. C., Valle, A., González-Pienda, J., & Lourenço, A. (2013). Grade level, study time, and grade retention and their effects on motivation, self-regulated learning strategies, and mathematics achievement: a structural equation model. *European Journal of Psychology of Education*, *28*, 1311-1331.

Rumelhart, D. E. (1980). Schemata: The building blocks of cognition. In R. J. Spiro et al. (Eds.), Theoretical issues in reading comprehension (pp. 33–58). Hillsdale, NJ: Erlbaum.

Schouwenburg, H. (2004). Trait procrastination in academic settings: An overview of students who engage in task delays. In H. Schouwenburg, C. Lay, T. Pylchyl, &J. Ferrari, (Eds), Counselling the procrastinator in academic settings (pp. 3-18). Washington: *American Psychological Association*.

Schunk, D. H., & DiBenedetto, M. K. (2016). Self-efficacy theory in education. In K. R. Wentzel & D. B. Miele (Eds.), *Handbook of motivation at school* (pp. 34–54). New York, NY: Routledge.

Shapiro, A. M. (2004). How Including Prior Knowledge as a Subject Variable May Change Outcomes of Learning Research. *American Educational Research Journal, 41,* 159-189.

Shuell, T. J. (1988). The Role of the Student in Learning from Instruction. *Contemporary Educational Psychology, 13*, 276-295.

Song, H. S., Kalet, A. L., & Plass, J. L. (2016). Interplay of prior knowledge, self- regulation and motivation in complex multimedia learning environments. *Journal of Computer Assisted Learning*, *32*, 31-50. doi: 10.1111/jcal.12117.

Steel, P. (2007). The Nature of Procrastination: A Meta-Analytic and Theoretical Review of Quintessential Self-Regulatory Failure. *Psychological Bulletin, 133*, 65-94.

Valle, A., Núñez, J.C., Cabanach, R., Rodríguez, S., Rosário, P., & Inglés, C. (2015). Motivational profiles as a combination of academic goals in higher education. *Educational Psychology*, *35*, 634–650, DOI: 10.1080/01443410.2013.819072.

Van Eerde, W. (2000). Procrastination: Self-regulation in initiating aversive goals. *Applied Psychology: An International Review, 49*, 372-389.

Van Eerde, W. (2003). A meta-analytically derived nomological network of procrastination. *Personality and Individual Differences, 35*, 1401-1418.

Warsame, M., Mortensen, A., Janif, J. (2014). Improving educational achievement for students from Somali backgrounds in Auckland, New Zealand: An evaluation of a school catch-up programme. *The Australasian Review of African Studies*, *35*, 25-44.

Wäschle, K., Allgaier, A., Lachner, A., Fink, S., & Nückles, M. (2014). Procrastination and Self-efficacy: Tracing vicious and virtuous circles in self-regulated learning. *Learning and Instruction, 29*, 103-114. doi.org/10.1016/j.learninstruc.2013.09.005

West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with non-normal variables: problems and remedies. In R. Hoyle (Ed.), Structural equation modeling: concepts, issues and applications (pp. 56–75). Newbury Park: Sage.

Winne, P. H., & Hadwin, A. R. (2008). The weave of motivation and self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), Motivation and self-regulated learning: Theory, research, and applications (pp. 297–314). New York: Taylor & Francis

Wolters, C. A. (2003). Understanding Procrastination From a Self-Regulated Learning Perspective. *Journal of Educational Psychology, 95*, 179-187

Wu, F., & Fan, W. (2016). Academic procrastination in linking motivation and achievement-related behaviors: a perspective of expectancy-value theory. *Educational Psychology*, 1-17. doi: 10.1080/01443410.2016.1202901

Yerdelen, S., McCaffrey, A., & Klassen, R. M. (2016). Longitudinal Examination of Procrastination and Anxiety, and Their Relation to Self-Efficacy for Self-Regulated Learning: Latent Growth Curve Modeling. *Educational Sciences: Theory & Practice, 16*, 5-22. doi: 10.12738/estp.2016.1.0108

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, *45*, 166-183.

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal*, *29*, 663-676.

Zuffianò, A., Alessandri, G., Gerbino M., Kanacri, B., Di Giunta, L., Milioni, M., & Caprara, G. (2013). Academic achievement: The unique contribution of self-efficacy beliefs in self-regulated learning beyond intelligence, personality traits, and self-esteem. *Learning and Individual Differences*, *23*, 158-162. doi.org/10.1016/j.lindif.2012.07.010

CAPÍTULO 2

“It Is Funnier to Chat with Our Friends Than Do Homework”: Adolescents’ Perspectives on the Academic Procrastination Process

3. "It Is Funnier to Chat with Our Friends Than Do Homework": Adolescents' Perspectives on the Academic Procrastination Process

3.1 Abstract

Academic procrastination is commonly defined as the act of delaying the beginning or the completion of a timely task; it is a widespread behavior among students. Still, adolescents' academic procrastination has been receiving little attention from researchers. The current study explored Mozambican adolescents' perspectives of the process of academic procrastination and focused on three key aspects: reasons to procrastinate, type of tasks where youth usually procrastinate, and perceived consequences of the procrastination behaviors. To further understand this phenomenon, the reports teachers gave regarding their students' procrastination were also analyzed. Twenty-four adolescents from a pool of 300 (11th and 12th graders) reported high levels of procrastination and were selected to be interviewed along with their teachers (N = 8). Data was analyzed using content analysis. The findings, presented in a graphical model, show that perceived lack of content knowledge can be the antecedent of procrastination behaviors, particularly when it comes to homework. These findings may help teachers and school administrators create a better school environment that promotes learning engagement and inhibits procrastination.

Keywords: academic procrastination; mathematics; adolescents; homework; procrastination antecedents

3.2 Introduction

Academic procrastination is a common and serious problem in schooling (e.g., Katz, Eilot, & Nevo, 2014; Kim & Seo, 2015; Owens & Newbegin, 2000). Still, the prior research on this topic has been mainly focused on college (e.g., Ferrari, Keane, Wolf, & Beck, 1998; Tan et al., 2008; Wäschle, Allgaier, Lachner, Fink, & Nückles, 2014), despite academic procrastination behaviors are also very common among younger students (e.g., Katz et al., 2014; Scher & Osterman, 2002). Extant research on adolescents' procrastination has been examining the relationship between motivational variables (e.g., self-efficacy, self-efficacy for self-regulation, intrinsic and extrinsic motivation) and academic

procrastination (e.g., Katz et al., 2014). However, little is known about the process of academic procrastination in high school, especially among students from non-western cultural backgrounds (Klassen & Kuzucu, 2009; Klassen et al., 2009). To fill in this research gap, the current study aims to explore the perspectives on academic procrastination (i.e., reasons, tasks they usually procrastinate on, and the perceived consequences) of adolescents from Mozambique. In addition, to further understand the high school students' process of procrastination, the teachers' perspectives on the topic were also examined. Findings regarding the process of procrastination are expected to help inform school-based interventions focused on decreasing academic procrastination and promoting school achievement.

3.2.1 Procrastination, a scourge preventing achievement

Academic procrastination is commonly defined as the act of delaying the beginning or the completion of a timely task (Senécal, Julien, & Guay, 2003; Steel, 2007). The behavior of postponing academic assignments falls under this definition (Klassen, Krawchuk, & Rajani, 2008). The studies about academic procrastination also refer to this behavior as a failure of students' self-regulated learning (SRL) (Chu & Choi, 2005; DeRoma et al., 2003; Ferrari, 2001). Procrastination is also described as a form of motivational dysfunction, and it is expressed similarly across cultures (Klassen & Kuzuku, 2009; Tan et al., 2008). For example, when students face difficulties to cope with school tasks, they may postpone their work to engage in more enjoyable activities (Dewitte & Schouwenburg, 2002).

Literature presents some characteristics that can indicate either current or future procrastination behavior. Wäschle et al. (2014) examined college students and found that students with low academic self-efficacy procrastinate often, and they are more likely to develop a "vicious circle of academic procrastination" (p. 111). Findings indicated that the more that students postponed an assigned work, the more the difficulties to address and complete the task would increase; it was also less likely that the students would complete the subsequent tasks (Wäschle et al., 2014). In fact, it has been found that students feeling low confidence in their ability to perform tasks with success are likely to develop a tendency to procrastinate (Lay, 1992); they also may fail to meet academic tasks deadlines, namely homework (Klassen & Kuzuku, 2009; Klassen, Krawchuk, & Rajani, 2008; Lay & Schouwenburg, 1993). Hence, academic procrastination may limit the quality of the students' learning process. For example, academic procrastination in college is often associated with inhibiting behaviors such as avoidance of academic tasks, feelings of failure, depression, social disapproval; and test anxiety on the test day (Dewitte & Schouwenburg, 2002; Kliengsieck, Grund, Schmid, & Fries, 2013; Lay, 1992). A vast corpus of

research has also shown that academic procrastination is associated with low academic achievement (Ferrari, Johnson, & McCown, 1995; Katz et al., 2014; Steel, 2007; Tan et al., 2008; Wesley, 1994).

Factors contributing to academic procrastination have also received researchers' attention. Ferrari and colleagues (1998) and Orpen (1998), for example, analyzed internal (e.g., students' volition and negative emotions) and external antecedents of academic procrastination (e.g., complexity of the task) (Ferrari et al., 1995; Schraw, Wadkins, & Olafson, 2007). Volition antecedents were found to play an important role in one's strength to cope with low interest and lack of pleasure while learning the content (Grunschel, Patrzek, & Fries, 2013). They also affect one's ability to avoid the negative influences of social distractors (Ferrari et al., 1995). Negative emotions such as stress, frustration, feelings of annoyance, indecision decisions, and task avoidance have been identified as affective antecedents of procrastination (Grunschel et al., 2013; Kliengsiek et al., 2013). Research focused on the external antecedents of procrastination has found that students are more likely to procrastinate their school work when they perceive tasks as important, stressful, and difficult (Pychyl, Lee, Thibodeau, & Blunt, 2000). Moreover, the influence of social events (Kliengsiek et al., 2013) and attractive alternatives (e.g., watching TV, enrolling social networking such as Facebook, WhatsApp, mobile phones; Sampaio, Polydoro, & Rosário, 2012) were also found to be associated with academic procrastination.

3.2.2 Academic procrastination of adolescent students

Orpen (1998) analyzed high school students' behaviors and found that academic procrastination was negatively related to academic achievement and academic attitudes. Regarding the latter, the author explained that negative attitudes towards school subjects and study assignments are likely to be associated with non-completion of school tasks (e.g., homework) which help to explain their low achievement. Interestingly, Owens and Newbing (1997, 2000) "flipped the coin" and examined high school students' mathematics grades as a predictor of academic procrastination. Findings indicated that low grades in mathematics, irrespective to the gender, showed a strong effect on academic procrastination. Owens and Newbing also found that academic procrastination behaviors increased throughout high school.

The study conducted by Klassen and Kuzucu (2009) added to literature by providing information regarding three aspects of procrastination: the duration of the procrastination behavior, the type of academic tasks where adolescents most often procrastinate, and the nature of the behaviors displayed while procrastinating. Findings indicated that about 80% of the participants used to spend more than an

hour a day engaged in academic procrastination behaviors, and more than 40% spent three hours a day procrastinating school behaviors (e.g., essays, homework and daily study). Boys reported to engage in procrastination behaviors as follows: by watching TV, surfing the net, chatting online or playing on the computer. Girls, however, reported that when they procrastinate they tend to read books, newspapers and magazines. Those procrastination behaviors were found to be strongly predicted by low academic self-efficacy and low self-efficacy for self-regulation (see also Klassen et al., 2009). Consistent with those findings, Katz et al. (2014) found negative associations between middle school students' self-efficacy and homework procrastination; both components are mediated and moderated by intrinsic motivation to do homework. Finally, Dietz et al., (2007) discussed the procrastination phenomenon as being culturally influenced, for example, by the individual orientations regarding school values. Authors found that 6th and 8th graders who rated higher on postmodern values (i.e., leisure preference) and lower on modern values (i.e., choose academic tasks) reported to procrastinate more and engage less in learning routines. Moreover, when these students were confronted with two conflicting hypothetical situations, leisure activities versus learning tasks, they tended to prefer the former and ignore the latter. Research on the cultural aspects of academic procrastination behavior is limited, however, the authors of the current research believe that their findings may add to literature in this aspect.

3.3 Purpose of the present study

Research analyzing the process of academic procrastination of adolescents is still limited (Katz et al., 2014). The topic, however, is particularly important because academic procrastination is related to low academic achievement (e.g., Kim & Seo, 2015; Owens & Newbegin 1997, 2000), and low achievement is closely associated with school dropout. Moreover, early dropout is related to poor socio-emotional skills, low economic resources, and less promising employment opportunities (e.g., Jimerson, 1999; Klassen et al., 2008). All of these problems are present in the Mozambican society (e.g., Fox, Santibañez, Nguyen, & André, 2012). The study of academic procrastination in a non-western context that faces severe economical and societal constraints is expected to help with the design of school-based interventions for this school grade level; consequently, it will also contribute to the development of the Mozambican students' school success (e.g., Fox et al., 2012). Moreover, despite each African country's own social and economic patterns of development, there are close similarities between their educational

systems (Samoff, 1999). This could mean that the findings of this study could be useful to educational systems beyond the Mozambican.

To the authors' knowledge, with a few exceptions (e.g., Owens & Newbing, 1997, 2000), previous studies conducted with adolescents did not focus on one school subject. The rationale for this investigation's focus on mathematics is related to the role played by this content in other school subjects (e.g., biology, physics) as well as its association with the development of life and citizenship skills (e.g., Hagger, Sultan, Hardcastle, & Chatzisarantis, 2015).

The current study addressed the process of academic procrastination in mathematics among Mozambican high school adolescents. Interviews were focused on three aspects of the procrastination behavior: the reasons for the procrastination, the tasks students usually put off, and the perceived consequences of the procrastination behaviors.

Moreover, as prior research has reported, teacher behavior in class is an important antecedent of academic procrastination (e.g., Schraw et al., 2007). In the current research, the teachers of the participating students were interviewed to gain a deeper insight on the students' procrastination process. To the authors' knowledge, this is the first study focused on academic procrastination that has gathered information from two independent sources: students and teachers. It is believed that this compound of data may help deepen the understanding of the phenomenon.

3.4 Method

3.4.1 Study context and Participants

The compulsory education in the Mozambican school system is comprised by primary school (i.e., from 1st grade to 7th grade) and secondary school (i.e., from 8th to 12th grade). This secondary school has two cycles (i.e., the first cycle comprises 8th up to 10th grade; while the second cycle comprises the 11th and the 12th grades). The current research was conducted with the students of the second cycle of secondary school (high school) and their teachers. According to national reports of Education in Mozambique, each class has around 70 or more students (Fox et al., 2012), which is a much higher number of students per class than those in most western countries. Classes in western countries typically have between 25 to 35 students per class (Eurydice, 2012).

With the aim to better understand the academic procrastination process, the researchers of the current study interviewed the students who reported high academic procrastination behaviors (see Grunschel et al., 2013; Klingsieck et al., 2013; Schraw et al., 2007).

In the city of Maputo, the school administrator of the high school with the highest enrollment was asked for permission to conduct investigations there. All the 903 students enrolled in the final grade levels of high school (11th and 12th grade) were invited to participate, and 684 agreed to participate in the study (response rate of 76%). From this pool, three hundred 11th and 12th grade students were randomly selected.

Finally, 300 students aged between 16 and 19 years (M_{age} = 17.79; *SD* = 1.28) responded to a questionnaire of academic procrastination (see procedure section). Of these students, 24 (15 girls) were identified as reporting high procrastination behaviors (thirteen 11th graders and eleven 12th graders). School records showed the following: i. all 24 students have failed on mathematics at least twice; ii. 85% of their parents show a low educational attainment (i.e., elementary school), and iii. none of the students were receiving any educational funding from the government. The mathematics teachers of these students (*N* = 8; 1 female) had 10.7 years of teaching experience in average (*SD*= .79).

3.4.2 Procedure

Prior to data collection, permission to run the study was obtained from the Education District Office, school directors, and parents of the students. The participation of students and teachers was voluntary, and confidentiality and anonymity were assured for all enrolled.

Firstly, (see Figure 1), students were asked to fill out a questionnaire developed by Rosário et al. (2007) to assess academic procrastination. This instrument encompasses ten 5-point Likert scale items (1, never to 5, always) related to procrastination for both daily study and the study for exams (α = .74 in the present study). Then, data was analyzed by quartiles. The students (*N* = 24) of the fourth quartile (i.e., highest scores on the academic procrastination questionnaire) were selected and recruited for individual interviews in a second phase (see Figure 1). The number of students enrolled in the interviews was within the recommended range (20-30) indicated by Warren (2002) and was expected to ensure enough diversity and the saturation of data (e.g., Baker & Edwards, 2012). After 12 interviews with the students and five interviews with the teachers, no new themes emerged, therefore it was concluded that the saturation of data had been reached.

Similar to previous studies (e.g., Peterson & Irving, 2008), the interviews addressed four key aspects: *definition* (i.e., what is academic procrastination? How would you define it?), *personal response* (i.e., How do you procrastinate? What kind of things do you do when you procrastinate? In what kind of situations do you procrastinate? How often do you procrastinate?), *antecedents/reasons* (i.e., what are the reasons that lead you to procrastinate?), and *perceived impact* (i.e., what are the consequences of your procrastination? What do you think that could help you stop procrastinating?). Before the study began, five students were interviewed to check whether these questions were easily understood. Data from these interviews was not included in our results. None of the five students were familiar with the term 'procrastination', so the question related to the first key aspect was excluded from the final semi-structured interview guide. In the beginning of the interview, a definition of procrastination was provided as follows:

This interview is about academic procrastination. According to Portuguese dictionary, procrastination means "postpone a task; delay; putting it off until later". I am interested to understand how adolescents of your age procrastinate in their academic life, the reasons to do so, and what may be the consequences of procrastinating in school tasks.

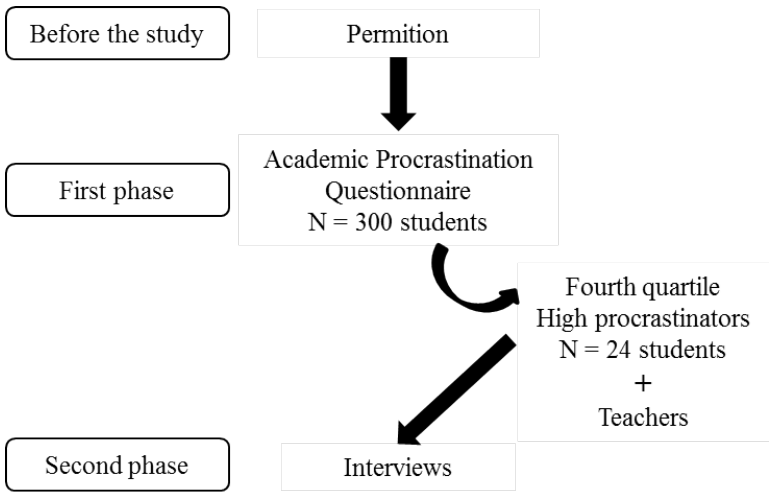

Figure 2. Schematic of procedures of data collection

The 24 interviews were conducted in school after classes and lasted approximately 15 to 20 minutes. As the interview was open-ended, the researcher encouraged students to answer using prompt questions (e.g., Can you explain your idea? Can you give me an example?).

Like their students, teachers were not familiar with the term procrastination. The interviews with the teachers followed a similar protocol to that of the students, but the focus was on their perception of

the students' academic procrastination behaviors and on their responses to those behaviors (i.e., What do you do when you notice that your students procrastinate?).

It should be noted that all interviews were audio recorded and transcribed *verbatim*.

3.4.3 Data analysis

The QSR International's NVivo 10 software was used to assist with the organization, management, coding, and querying process of the data (e.g., Richards, 2005). The content analysis followed the steps (i.e., pre-analysis, exploration of data, and treatment) described by Bardin (1996). The analysis started with the reading of the *verbatim* transcriptions to get an overall idea of the data (i.e., pre-analysis). In the coding process (i.e., exploration of data), the number of participants who referred to an idea was used to identify the themes. The identification of categories and subcategories followed a deductive and an inductive iterative process. In the case of the former, all categories and subcategories were organized a priori in a codebook based on the literature (e.g., Grunschel et al., 2013; Klingsieck et al., 2013; Schraw et al., 2007). For the latter, as the analysis was carried out, new subcategories were added using the participants' own words. Every time this happened, all the transcriptions were reviewed to check if the coded material fit better in the new subcategories. The NVivo 10 software provided the number of participants in each subcategory and the respective frequencies were calculated (i.e., treatment; Bardin, 1996).

To enhance trustworthiness of findings (Lincoln & Guba, 1985), some methodological procedures were conducted. One member of the research team coded all the material, and an external auditor (expert on procrastination) reviewed all data to identify variations in the coded material. The two researchers then reviewed all themes and discussed the differences found to reach a consensus. The Kappa value obtained was .84, considered as very good according to Landis and Koch (1977).

3.5 Findings

Students' speeches focused on the school tasks where they reported to procrastinate most often, the possible reasons and consequences of those behaviors, and the strategies that could help them avoid procrastinating. To gain a deeper insight of this process, the teachers of the participating students

provided their perspectives regarding their students' procrastination behaviors. The teachers also explained how they usually respond to such behaviors.

When discussing their procrastination behaviors, all students reported that they usually postpone their mathematics homework assignments (see Figure 2), and this proposition was corroborated by their teachers. From the students' perspectives, this behavior may occur due to many reasons such as low motivation or interest in the task, lack of knowledge or competence in mathematics, the commitment they have to help the family or do household chores, and the high amount of time spent socializing either in person or with the use of technology and social networks (e.g., surfing on Facebook and sending texts using WhatsApp).

Still, the lack of knowledge or competence to do the homework assignment was the main reason behind the delay homework completion. The majority of the students disclosed distress related to their perceived lack of skills in mathematics: "I can't even solve the exercises assigned by my mathematics teacher..." (P_{12}), "I usually don't understand the homework tasks, they are too difficult for me..." (P_{23}), "I was never good at mathematics, I don't have enough knowledge of mathematics to do homework alone, it's too much difficult for me, and I do not have any help at home" (P_{13}).

Most of the female students added another reason to frequently miss homework related to their involvement in household chores. Girls explained that they are expected to do daily chores at home, and some of them said that they are also expected to take care of their little siblings. "When I finish school I must hurry because I need to get home quickly to cook for my family." (P_6).

All students reported that they postpone their academic tasks due their interaction with their friends via WhatsApp or Facebook. When asked to explain why they do that, the students explained that "they are fun" and "a more interesting thing [than studying], because it is just a click away" (P_9). One of the students said, "It is much funnier to chat with our friends than do homework" (P_3).

Other reasons behind procrastination that students provided included playing with their friends, attending church services, or watching television. Still, when it came to mathematics, low motivation or interest in the subject was the main reason to postpone the homework.

Due to the reported reasons, participant students said that they frequently copy homework at the last minute from their classmate or attend classes without having the homework completed. Only a few students reported that they arrive at school earlier to ask either classmates with good grades in math or their teacher for help on homework. Still, these students explained that it is very difficult to find time to talk with teachers outside of the class to solve homework doubts because there is no scheduled time or place for students to meet with teachers.

All the students reported negative consequences of their procrastination behaviors (e.g., homework non-compliance, lack of knowledge, low achievement, and negative affect). Some of the students who tended to miss homework frequently explained that when the teacher finds students in class who missed homework then those students are expelled from class and asked to complete the homework before returning to class. Meanwhile in class, teachers check homework on the board and the students expelled miss the opportunity to learn from this feedback. A student who referred to missing homework frequently expressed their despair saying that "I feel like I'm always missing the boat..." for "not attending class" (P_3).

As the participants reported, procrastinating schoolwork leads to a negative feedback loop: miss homework, fail homework correction, and miss class. This loop creates learning gaps and an uneven distribution of knowledge. The students affected by this aftermath exemplified their frustration and stress:

"I think I'm far behind...I do not understand the contents...I will never learn the topics" (P_2)

"The consequences are simple! When the day of the test comes, I realize that I do not understand the content delivered, and I fail..." (P_7)

"On the day of the test, I'm not able to solve the exercises...." (P_6)

As some participants reported, this negative feedback loop promotes low academic achievement (e.g. "I don't know how to solve the exercises... I miss homework... I have to leave the classroom and I get a bad grade", P_4) and feeds procrastination behaviors (e.g. "having bad grades in math keeps me procrastinating, and procrastinating is becoming a habit...", P_{24}). Some students referred to being "stuck" (P_{15}) in the procrastination "cobwebs" (P_{18}). This may lead to emotional disengagement; however, only a few students identified this negative effect because of their procrastination behaviors:

"I feel bad... looking anxious I may fail the school year..." (P_{21}).

"I'm agitated... and when I get to school I feel nervous...when I have test...My head is hot and I'm really agitated" (P_8).

"I'm afraid of the classroom...I hate math!" (P_2).

When students were asked about what could help them to decrease their procrastination behaviors, two ideas were mentioned. Firstly, "do not give up immediately... try to find other ways to solve the exercises" (P_{22}) or "try to get some help earlier, not just before class" (P_4). Secondly, it was suggested that "the teacher[s] should try to understand the students..." (P_{21}). When participants were prompted to clarify this topic, they explained that teachers should not expel students from class for not completing homework; if students "miss checking homework on the board and content delivered in class, they will continue failing to understand content, miss homework, and... show bad grades" (P_1).

Another student added:

"In class we have tried to explain to the teachers our reasons to miss homework, but they never listen and order us to leave class... there are some students that miss homework because they don't care, but others miss homework because they have many difficulties... still, teachers do not care..." (P_5)

When teachers were asked how they cope with their students' procrastination behaviors in class (e.g., missing homework), their responses were threefold: expelling students from the classroom and asking them to do homework before returning to class; communicating to the whole class the benefits of homework; and counting homework into the overall grade.

Half of the participating teachers reported that they value homework, so when students miss homework, they are expelled and asked to do homework outside the classroom:

"I try to educate them. I put pressure on them to do homework. When they miss homework, I ask them to leave class, and I tell them to do homework in an isolated place outside the classroom. This way they [can] complete the assignment and then return to class." (T_1).

Another teacher highlighted the same idea:

"Teachers need to take serious educational measures to maintain order and respect for the learning environment. If students do not comply with their duty do homework, they have no right to be in the classroom. They [can] only return to class with the assignment completed." (T_3)

The remaining teachers reported that they talk with their students about the benefits of doing homework for learning and academic achievement. Moreover, they reported discussing the value of education for the students' future lives. They encourage the students to study hard by giving examples of famously successful Mozambicans. One teacher added that he also counts homework in the students' assessments ("I give positive grades to those who completed homework and negative grades to those who did not", T_7) to induce change in the procrastination behavior of his students.

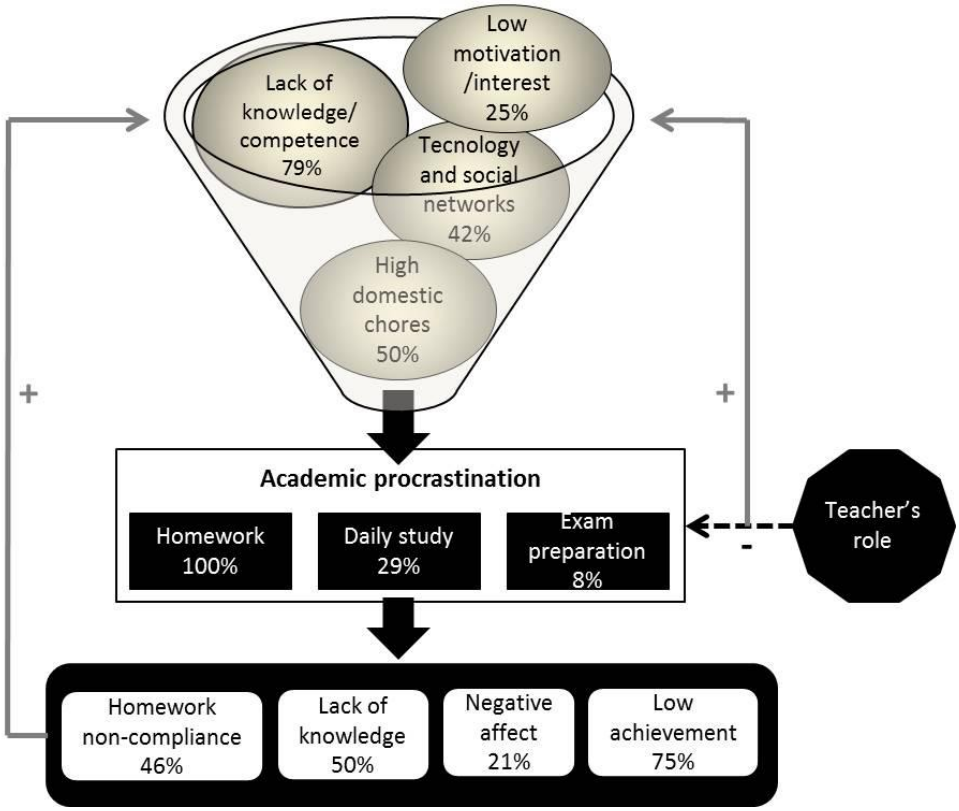

Figure 3. Graphical model of adolescents' academic procrastination process

3.6 Discussion and Implications

The current study aimed to explore adolescents' academic procrastination process regarding the tasks of which students tend to procrastinate, the antecedents of procrastination, and the students' perception of the consequences of procrastination. To further analyze the process, teachers were also interviewed to discuss their strategies for handling students' procrastination behaviors.

A few participants reported to procrastinate in their general daily studies or preparations for exams, but all participating students reported to procrastinate in their mathematics homework assignments. This finding could be related to the fact that in the Mozambican school system, homework is a mandatory school task assigned and monitored daily by teachers. In fact, unlike the students study behaviors where procrastination may be kept covert (i.e., external control is often lacking and the academic consequences are displaced in time and non-contingent on those procrastination behaviors) (e.g., Klingsieck, 2015; Milgram & Tenne, 2000), the homework procrastination is likely to be overt. This may be due to teachers' control on homework completion and the academic consequences of missing homework (e.g., leave class

to complete homework outside). However, students may not have reported procrastinating because they do not follow study routines (Dietz et al., 2007; Pychyl, Morin, & Salmon, 2000).

The findings show that for most participants, the perceived lack of knowledge in mathematics is the main antecedent for the procrastination of these assignments. This is a worrying scenario because mathematics ties in with other important areas of knowledge (e.g., biology, physics) and with the development of life and citizenship skills (e.g., Hagger et al., 2015). Moreover, prior studies have showed that poor mathematics performance is associated with school dropout (Fall & Roberts, 2012; Fetler, 2001; Werblow & Duesbery, 2009).

Globally, the findings support the need to intervene students' procrastination behaviors as soon as possible to prevent them from accumulating learning gaps. In general, learning gaps are likely to result in academic failure and early dropout (see Fall & Roberts, 2012). There are a few ways to help students diminish their procrastination and become more engaged in their homework. For example, teachers could consider reflecting on the design of the homework assignments. Recent literature highlights that purposeful homework assignments fitted to students' learning needs and level of competence are expected to help them understand the assignments' instrumentality. This helps improve the students' engagement in the task which results in better academic achievement (e.g., Rosário Núñez, Vallejo, Cunha, Nunes, Mourão et al., 2015). In class, teachers could also consider emphasizing the importance of asking for help to further exploit the benefits of homework (Du, Xu, & Fan, 2016).

Participants reported struggling to find ways to do homework (e.g., strategies to solve exercises, asking for help), and they easily give up on homework in face of difficulties or distractors. As extant research has shown, there is a negative relationship between procrastination and SRL skills (e.g., Chu & Choi, 2005; DeRoma et al., 2003; Ferrari, 2001). In fact, students are expected to use SRL strategies in their personal study (e.g., time management, goal setting, note taking, test preparation) (Núñez, Rosário, Vallejo, & González-Pienda, 2013; Rosário, Núñez, Valle, González-Pienda, & Lourenço, 2013), but these strategies are seldom trained in class (Rosário et al., 2013). Therefore, school administrators, school psychologists and educators could consider training the students to use SRL strategies to overcome academic procrastination (e.g., Rosário, Núñez, Trigo et al., 2015).

Out of the participants involved, more girls than boys, reported procrastinating their schoolwork due to their high involvement in domestic chores. This data is consistent with that of Githua and Mwangi (2003) who found that one of the factors explaining the academic underperformance of girls in Kenya is because they lack of time for studying and completing mathematics homework due to their high involvement in domestic chores. Moreover, Taímo (2015) reported that one of the reasons related with the Mozambican

girls' poor school performance and dropout are their families' high expectations for receiving help with domestic chores (e.g., collecting and cutting firewood, fetching water, cooking, babysitting, and taking care of the elderly). For these reasons, school administrators, educators, and school psychologists could consider working with families to help them value their childrens' schoolwork and become more involved in their children's' school lives. In fact, prior investigation has shown that parents' support is likely to diminish homework procrastination (Dumont, Trautwein, Nagy, & Nagengast, 2014) and help improve students' self-regulation skills, responsibility for academic tasks, and quality of learning (Bempechat, 2004; Xu, Benson, Mudrey-Camino, & Steiner, 2010). There could be school-based sessions provided for parents to inform them of examples of good practices (e.g., parents' involvement in homework management). These behaviors should be able to be performed by all families, irrespective of their educational level or socioeconomic status (e.g., Cunha et al., 2015; Xu & Corno, 2003).

In the present study, participants also mentioned technology and social networking as a procrastination antecedent; this finding is consistent with that reported by Klassen and Kuzuku (2009). Recent works conducted in mathematics showed that middle and high school students reporting higher homework distraction related to technology also reported spending more time on homework (which may be related to procrastination), lower interest and effort on homework, lower skills to manage their homework environment, and lower amount of homework completion (see Xu, 2015; Xu, Fan, & Du, 2015). Overall, the use of technology (e.g., computer, games, and online chats) as an antecedent of procrastination is increasing among adolescents (e.g., Xu, 2015). To help cope with this distraction, families could consider monitoring their students' usage of technology devices.

The last antecedent reported by the participants is related to lack of motivation and interest to engage in mathematics. Most of the participants mentioned lack of competence in mathematics, which is negatively related to intrinsic motivation and engagement in academic tasks (see Ryan & Deci, 2000). To foster students' motivation to complete their homework assignments and avoid procrastination, teachers can try to reflect upon their homework practices and adapt the assignments to match students' level of knowledge; teachers can also stress the instrumentality of doing homework (see Rosário Núñez, Vallejo, Cunha, Nunes, Mourão et al., 2015; Xu, 2008).

As a result of their procrastination behaviors, participants reported that they often miss their homework which frequently results in expulsion from the class until they finish the homework outside. Missing class results in the lack of deeper knowledge and understanding; overall, expulsion does not prevent students from procrastinating their assignments. Consistent with participants' perspectives (see Figure 2), literature showed that the more students procrastinate, the more negative emotions they

experience (e.g., Kliengsiek et al., 2013), and the lower the likelihood for homework completion (e.g., Xu, 2015), feelings of competence (e.g., Orpen, 1998), and the school grades (e.g., Kim & Seo, 2015).

The current study analyzed teachers' voices regarding their actions used to cope with their students' homework procrastination. Participants reported that when students miss homework, they expel these students from class until the students complete homework outside. While teachers mentioned that this practice is aimed at diminishing their students' homework procrastination, students reported this educational practice as an obstacle in their learning progress. For this reason, the teachers' role is represented in Figure 2 by the dotted arrow. The act of missing class feeds learning difficulties and learning gaps, which according to students, prevents them from completing homework. When students miss homework, a loop of disengagement and procrastination is activated. As Figure 2 also shows, the lack of knowledge and competence emerges as either an antecedent or a consequence of procrastination. This aligns with prior findings that describe this "vicious circle of procrastination" (Wäschle et al., 2014, p. 111). Participants reported they feel "stuck" (P_{15}) in the procrastination "cobwebs" (P_{18}), and they need help to block this negative circle. Contrary to teachers' educational intentions, expulsion from class deprives students from receiving feedback on their homework which is an important tool to maximize the benefits of homework (e.g., Cooper, 2001; Walberg & Paik, 2000). Attendance is critical to helping students become more engaged in their learning and improvement towards academic achievement (e.g., Elawar & Corno, 1985; Núnez et al., 2015; Rosário, Núñez, Vallejo, Cunha, Nunes, Suárez et al., 2015).

Participating teachers reported using two other behaviors in response to their students' procrastination behaviors (i.e., communication of the benefits of doing homework and value of education for future life, and counting homework into the overall grade). However, students did not report those teachers' practices as beneficial to their school work and the diminishment procrastination.

A close examination of the Mozambican school environment may be an important contribution to explain findings because a non-western environment can offer a different perspective. For example, Mozambican teachers may find it difficult to manage students' maladaptive homework behaviors or promote SRL strategies in large classes with an average of 70 students (see Fox et al., 2012). In fact, teaching a large class in high school poses many challenges; for example, a large class can promote behaviors that both reflect and promote students' lack of involvement in class. It is difficult for the teacher in a large class to pay attention to students individually. School administrators may wish to reflect on educational measures to respond to this relevant constraint to teachers' practice because this aspect may be related to many students' educational problems.

Despite the strengths of the current study, some limitations can be acknowledged. The selectivity of informants (i.e., students that reported higher scores on academic procrastination) might be considered a limitation because it may confine the diversity of students' perspectives (see Bakadorova & Raufelder, 2015). Moreover, because of this methodological selection of participants, gender was not balanced. Thus, despite previous findings showing gender differences in academic procrastination of students (e.g., Özer, Demir, & Ferrari, 2009; Sénecal et al., 1995), the current study did not separately analyze the perspectives of girls and boys on academic procrastination. Future studies could consider exploring the perspectives of boys and girls on the process of academic procrastination, and quantitative studies may use gender as a covariate. In general, it would be useful to investigate the graphical model of students' academic procrastination process (see Figure 2) in other cultures, domains, and school levels (e.g., elementary and middle school). Finally, given that the current study showed that the students' involvement in domestic chores is an important procrastination antecedent, it would be useful to interview the parents of the participating students to further understand the academic procrastination process. Future studies could consider collecting information from parents regarding their children's procrastination behaviors.

To conclude, procrastination is a serious problem among Mozambican adolescents that needs further research and intervention in educational settings. The current study provides useful information for researchers and educational stakeholders to help diminish this scourge in education.

3.7 References

Bakadorova, O., & Raufelder, D. (2015). Perception of teachers and peers during adolescence: Does school self-concept matter? Results of a qualitative study. *Learning and Individual Differences*, *43*, 218-225. doi:10.1016/j.lindif.2015.08.035

Baker, S. E., & Edwards, R (2012). N. C. R. M. How many qualitative interviews is enough? National Center for Research Methods. Retrieved from http://eprints.ncrm.ac.uk/2273/.

Bardin, L. (1996). *The content analysis*. Paris: PUF.

Bempechat, J. (2004). The motivational benefits of homework: A social-cognitive perspective. *Theory Into Practice*, *43*(3), 189-196.

Chu, A. H. C., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *The Journal of Social Psychology*, *145*, 245-264. doi:10.3200/SOCP.145.3.245-264

Cooper, H. (2001). *The battle over homework: Common ground for administrators, teachers, and parents* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Cunha, J., Rosário, P., Macedo, L., Nunes, A. R., Fuentes, S., Pinto, R., & Suárez, N. (2015). Parents' conceptions of their homework involvement in elementary school. *Psicothema*, *27*, 159-165. doi:10.7334/psicothema2014.210

DeRoma, V. M., Young, A., Mabrouk, S. T., Brannan, K. P., Hilleke, R. O, & Johnson, K. Y. (2003). Procrastination and student performance on immediate and delayed quizzes. *Education*, *124*, 40 – 48.

Dewitte, S., & Schouwenburg, H. (2002). Procrastination, temptation and incentives: The struggle between the present and the future in procrastination and the punctual. *European Journal of Personality*, *16*, 469-489.

Dietz, F., Hofer, M., & Fries, S. (2007). Individual values, learning routines and academic procrastination. *British Journal of Educational Psychology*, *77*, 893-906. doi:10.1348/000709906X169076

Du, J., Xu, J., & Fan, X. (2016). Investigating factors that influence students' help seeking in math homework: A multilevel analysis. *Learning and Individual Differences*, *48*, 29-35. doi:10.1016/j.lindif.2016.03.002

Dumont, H., Trautwein, U., Nagy, G., & Nagengast, B. (2014). Quality of parental homework involvement: Predictors and reciprocal relations with academic functioning in the reading domain. *Journal of Educational Psychology*, *106*, 144-161. doi:http://psycnet.apa.org/doi/10.1037/a0034100

Elawar, M. C., & Corno, L. (1985). A factorial experiment in teachers' written feedback on student homework: Changing teacher behavior a little rather than a lot. *Journal of Educational Psychology, 77*(2), 162-173.

Eurydice (2012). *Números-chave da Educação na Europa*. Bruxelas: EACEA/Eurydice. doi:10.2797/81131

Fall, A. M., & Roberts, G. (2012). High school dropouts: Interactions between social context, self-perceptions, school engagement, and student dropout. *Journal of Adolescence*, *35*(4), 787-798. doi:10.1016/j.adolescence.2011.11.004

Ferrari, J. R. (2001). Procrastination as self-regulation failure of performance: Effects of cognitive load, self-awareness, and time limits on 'working best under pressure'. *European Journal of Personality*, *15*(5), 391-406. doi:10.1002/per.413

Ferrari, J. R., Johnson, J. L., & McCown, W. G. (1995). Procrastination research: A synopsis of existing research perspectives. In J. R. Ferrari, J. L. Johnson, & W. G. McCown (Eds.), *Procrastination and task avoidance: Theory, research, and treatment* (pp. 21–46). New York: Plenum.

Ferrari, J. R., Keane, S. M., Wolfe, R. N., & Beck, B. L. (1998). The antecedents and consequences of academic excuse-making: Examining individual differences in procrastination. *Research in Higher Education*, *39*(2), 199-215.

Fetler, M. (2001). Student mathematics achievement test scores, droupout rates, and teacher characteristics*. Teacher Education Quarterly, 28*(1), 151-168.

Fox, L., Santibañez, L., Nguyen, V., & André, P. (2012). *Education reform in Mozambique: Lessons and challenges*. World Bank Publications.

Githua, B. N., & Mwangi, J. G. (2003). Students' mathematics self-concept and motivation to learn mathematics: Relationship and gender differences among Kenya's secondary-school students in Nairobi and Rift Valley provinces. *International Journal of Educational Development*, *23*(5), 487-499. doi:10.1016/S0738-0593(03)00025-7

Grunschel, C., Patrzek, J., & Fries, S. (2013). Exploring different types of academic delayers: A latent profile analysis. *Learning and Individual Differences*, *23*, 225-233. doi:org/10.1016/j.lindif.2012.09.014

Hagger, M. S., Sultan, S., Hardcastle, S. J., & Chatzisarantis, N. L. (2015). Perceived autonomy support and autonomous motivation toward mathematics activities in educational and out-of-school contexts is related to mathematics homework behavior and attainment. *Contemporary Educational Psychology*, *41*, 111-123. doi:org/10.1016/j.cedpsych.2014.12.002

Jimerson, S. R. (1999). On the failure of failure: Examining the association between early grade retention and education and employment outcomes during late adolescence. *Journal of School Psychology*, *37*(3), 243-272. doi:10.1016/S0022-4405(99)00005-9

Katz, I., Eilot, K., & Nevo, N. (2014). "I'll do it later": Type of motivation, self-efficacy and homework procrastination. *Motivation and Emotion*, *38*(1), 111-119. doi:10.1007/s11031-013-9366-1

Kim, K. R., & Seo, E. H. (2015). The relationship between procrastination and academic performance: A meta-analysis. *Personality and Individuals Differences, 82*, 26-33. doi:10.1016/j.paid.2015.02.038

Klassen, R. M., & Kuzucu, E. (2009). Academic procrastination and motivation of adolescents in Turkey. *Educational Psychology*, *29*(1), 69-81. doi:10.1080/01443410802478622

Klassen, R. M., Ang, R. P., Chong, W. H., Krawchuk, L. L., Huan, V. S., Wong, I. Y F, & Yeo, L. S. (2009). A cross-cultural study of adolescent procrastination. *Journal of Research on Adolescence, 19,* 799-811.

Klassen, R. M., Krawchuk, L. L., & Rajani, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology*, *33*(4), 915-931. doi:10.1016/j.cedpsych.2007.07.001

Klingsieck, K. B. (2015). Procrastination: When good things don't come to those who wait. *European Psychologist, 18*(1), 24-34. doi:10.1027/1016-9040/a000138

Klingsieck, K. B., Grund, A., Schmid, S., & Fries, S. (2013). Why students procrastinate: A qualitative approach. *Journal of College Student Development*, *54*(4), 397-412.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174.

Lay, C. H. (1992). Trait procrastination and the perception of person-task characteristics. *Journal of Social Behavior and Personality*, *7*(3), 483-494.

Lay, C. H., & Schouwenburg, H. C. (1993). Trait procrastination, time management, and academic behavior. *Journal of Social Behavior and Personality*, *8*(4), 647-662.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Milgram, N. A., & Tenne, R. (2000). Personality correlates of decisional and task avoidant procrastination. *European Journal of Personality, 14*(2)*,* 141–156.

Núñez, J., Rosário, P., Vallejo, G., & González-Pienda, J. (2013). A longitudinal assessment of the effectiveness of a school-based mentoring program in middle school. *Contemporary Educational Psychology*, *38*, 11–21. doi.org/10.1016/j.cedpsych.2012.10.002

Núñez, J., Suárez, N., Rosário, P., Vallejo, G., Cerezo, R., & Valle, A. (2015). Teachers' feedback on homework, homework-related behaviors, and academic achievement. *The Journal of Educational Research, 108*(3), 204-216. doi:10.1080/00220671.2013.878298

Orpen, C. (1998). The causes and consequences of academic procrastination: A research note. *Westminster Studies in Education*, *21*(1), 73-75. doi:10.1080/0140672980210107

Owens, A. M., & Newbegin, I. (1997). Procrastination in high school achievement: A causal structural model. *Journal of Social Behavior and Personality*, *12*(4), 869-887.

Owens, A. M., & Newbegin, I. (2000). Academic procrastination of adolescents in english and mathematics: Gender and personality variations. *Journal of Social Behavior and Personality*, *15*(5), 111.

Özer, B. U., Demir, A., & Ferrari, J. R. (2009). Exploring academic procrastination among Turkish students: Possible gender differences in prevalence and reasons. *The Journal of Social Psychology*, *149*(2), 241-257. doi:10.3200/SOCP.149.2.241-257

Peterson, E., & Irving, S. (2008). Secondary school students' conceptions of assessment and feedback. *Learning and Instruction, 18*, 238-250. doi:10.1016/j.learninstruc.2007.05.001

Pychyl, T. A., Lee, J. M., Thibodeau, R., & Blunt, A. (2000). Five days of emotion: An experience sampling study of undergraduate student procrastination. *Journal of Social Behavior and Personality*, *15*, 239-254.

Pychyl, T. A., Morin, R. W., & Salmon, B. R. (2000). Procrastination and the planning fallacy: An examination of the study habits of university students. *Journal of Social Behavior and Personality*, *15*, 135 - 150.

Richards, L. (2005). *Handling qualitative data: A practical guide*. London: Sage Publications.

Rosário, P., Costa, M., Mourão, R., Núñez, J.C., González-Pienda, J.A., & Valle, A. (2007). Procastination, SRL and Math achievement. *Academic Exchange Quarterly, 11*, 23-28.

Rosário, P., Núñez, J. C., Trigo, L., Guimarães, C., Fernández, E., Cerezo, R.. Fuentes, S., Orellana, M., Santibáñez, A., Fulano, C., Ferreira, A., & Figueiredo, M. (2015). Transcultural analysis of the effectiveness of a program to promote self-regulated learning in Mozambique, Chile, Portugal, and Spain. *Higher Education Research and Development*, *34*(1), 173-187. doi:10.1080/07294360.2014.935932

Rosário, P., Núñez, J. C., Vallejo, G., Cunha, J., Nunes, T., Mourão, R., & Pinto, R. (2015). Does homework design matter? The role of homework's purpose in student mathematics achievement. *Contemporary Educational Psychology*, *43*, 10-24. doi:10.1016/j.cedpsych.2015.08.001

Rosário, P., Núñez, J. C., Vallejo, G., Cunha, J., Nunes, T., Suárez, N., Fuentes, S., & Moreira, T. (2015). The effects of teachers' homework follow-up practices on students' EFL performance: A randomized-group design. *Frontiers in Psychology, 6*(1528), 1-11. doi:10.3389/fpsyg.2015.01528

Rosário, P., Núñez, J., Valle, A., González-Pienda, J., & Lourenço, A. (2013). Grade level, study time, and grade retention and their effects on motivation, self-regulated learning strategies, and mathematics achievement: a structural equation model. *European Journal of Psychology of Education, 28*, 1311-1331. doi:10.1007/s10212-012-0167-9

Ryan, R., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54-67. doi:10.1006/ceps.1999.1020

Samoff, J. (1999). Education sector analysis in Africa: Limited national control and even less national ownership. *International Journal of Educational Development*, *19*, 249-272. doi:10.1016/S0738-0593(99)00028-0

Sampaio, R. K., Polydoro, S. A., Rosário, P. (2012). Autorregulação da aprendizagem e a procrastinação acadêmica em estudantes universitários. *Cadernos de Educação*, *42*, 119-142.

Scher, S. J., & Osterman, N. M. (2002). Procrastination, conscientiousness, anxiety, and goals: Exploring the measurement and correlates of procrastination among school-aged children. *Psychology in the Schools*, *385*.

Schraw, G., Wadkins, T., & Olafson, L. (2007). Doing the things we do: A grounded theory of academic procrastination. *Journal of Educational Psychology*, *99*(1), 12-25. doi:10.1037/0022-0663.99.1.12

Senécal, C., Koestner, R., & Vallerand, R. J. (1995). Self-regulation and academic procrastination. *The Journal of Social Psychology*, *135*(5), 607-619. doi:10.1080/00224545.1995.9712234

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, *133*(1), 65-94.

Taímo, N. V. (2015). *Keeping Girls in School: Building the capacity of the women and education association in Mozambique*. Oxfam Novib.

Tan, C. X., Ang, R. P., Klassen, R. M., Yeo, L. S., Wong, I. Y.F., Huan, V. S., & Chong, W. H. (2008). Correlates of academic procrastination and students' grade goals. *Current Psychology, 27*(2), 135-144. doi:10.1007/s12144-088-9028-8

Walberg, H. J., & Paik, S. J. (2000). Effective educational practices. International Bureau of education. *Educational Practices Series – 3, 9*. Retrieved from http://www.ibe.unesco.org.

Warren, C. A. B. (2002). 'Qualitative Interviewing'. In J. F. Gubrium & J. A. Holstein (Eds.), *Handbook of Interview Research: Context and Method*. Thousand Oaks, CA: Sage.

Wäschle, K., Allgaier, A., Lachner, A., Fink, S., & Nückles, M. (2014). Procrastination and self-efficacy: Tracing vicious and virtuous circles in self-regulated learning. *Learning and Instruction, 29*, 103-114.

Werblow, J., & Duesbery, L. (2009). The impact of high school size on math achievement and dropout rate. *The High School Journal*, *92*(3), 14-23. https://doi.org/10.1353/hsj.0.0022

Wesley, J. C. (1994). Effects of ability, high school achievement, and procrastinatory behavior on college performance. *Educational and Psychological Measurement*, *54*(2), 404-408. doi:10.1177/0013164494054002014

Xu, J. (2008). Models of secondary school students' interest in homework: A multilevel analysis. *American Educational Research Journal*, *45*(4), 1180-1205. doi:10.3102/0002831208323276

Xu, J. (2015). Investigating factors that influence conventional distraction and tech-related distraction in math homework. *Computers & Education*, *81*, 304-314. doi:10.1016/j.compedu.2014.10.024

Xu, J., & Corno, L. (2003). Family help and homework management reported by middle school students. *The Elementary School Journal, 103*(5), 503-517.

Xu, J., Fan, X., & Du, J. (2015). Homework distraction scale confirming the factor structure with middle school students. *Journal of Psychoeducational Assessment*, 1-15. doi:10.1177/0734282915620900

Xu, M., Benson, S. N. K., Mudrey-Camino, R., & Steiner, R. P. (2010). The relationship between parental involvement, self-regulated learning, and reading achievement of fifth graders: A path analysis using the ECLS-K database. *Social Psychology of Education*, *13*(2), 237-269. doi:10.1007/s11218-009-9104-4

CONCLUSÃO GERAL

4. Conclusão geral

Existe um corpo robusto de estudos sobre a temática da procrastinação académica que visa explicar a sua relação com variáveis tais como a autoeficácia académica, autorregulação da aprendizagem e o seu impacto no rendimento académico (e.g., Katz, Eilot, & Nevo, 2014; Klassen et al., 2009; Wäschle, Allgaier, Lachner, Fink, & Nückles, 2014). A presente tese constitui um esforço na compreensão dos fatores que explicam a procrastinação académica. Para tal, foi analisada a sua relação com algumas variáveis tais como, o conhecimento prévio a matemática, autorregulação da aprendizagem e autoeficácia a matemática (capítulo 1), bem como na análise da análise das perceções dos alunos e seus professores sobre o processo de procrastinação académica (capítulo 2).

Que seja do nosso conhecimento, têm sido desenvolvidos poucos estudos sobre a procrastinação académica com adolescentes, combinando dados de alunos e de seus professores (e.g., Owens & Newbegin, 1997; 2000). Esta tese pretendeu desencadear estudos sobre a temática focalizando a realidade moçambicana, no sentido de contribuir para o alargamento da investigação no domínio, bem como para a prática educativa.

Para a recolha de dados, salienta-se que seguimos instrumentos disponíveis em estudos anteriores. Assim, procedemos à respetiva adaptação e validação dos instrumentos que revelaram características psicométricas robustas para a avaliação dos constructos centrais dos estudos que integram a presente tese, bem como para que sejam utilizados em futuros estudos.

Os resultados da análise do Modelo de Equações Estruturais proposto apontaram para a existência de associações e relações positivas e estatisticamente significativas entre o conhecimento prévio a matemática, a autorregulação da aprendizagem e a autoeficácia a matemática. Os resultados indicaram que ambas variáveis, o conhecimento prévio a matemática e autorregulação de aprendizagem explicam a autoeficácia a matemática e que a autoeficácia a matemática e a autorregulação de aprendizagem são negativa e significativamente relacionados com a procrastinação académica a matemática. Os dados permitem concluir que quanto mais conhecimento prévio os alunos tiverem, mais usarão estratégias de autorregulação da aprendizagem, maior será a sua perceção de autoeficácia a matemática, e, consequentemente, menor será a procrastinação académica a matemática.

Após a análise do modelo proposto, tanto na amostra de calibração, como na amostra de validação, concluímos que os índices de bondade de ajuste são bons e as relações entre as variáveis no modelo significativas.

No capítulo 2, explorámos a perceção dos alunos acerca das tarefas de estudo nas quais procrastinam com frequência, as razões da sua procrastinação académica a matemática, e as consequências percebidas. Para aprofundar o nosso estudo os professores de matemática dos alunos participantes também foram entrevistados.

Os alunos participantes reportaram que procrastinavam com frequência os TPC de matemática, fato que foi corroborado pelos respetivos professores de matemática. Os nossos participantes relataram que a sua procrastinação no TPC de matemática deve-se a baixa competência percebida, seguida do envolvimento em tarefas domésticas com mais ênfase para as raparigas, envolvimento em tecnologias e redes sociais e baixa motivação e pouco interesse pela disciplina. Em relação às consequências da sua procrastinação académica, os nossos participantes reportaram: notas baixas, fraco domínio da matemática tendo como consequência um afeto negativo. Também reportaram que quando não realizam os TPC, eram expulsos pelos professores para que completassem o TPC fora da sala de aulas, ficando impossibilitados de acompanhar a correção e o feedback do professor, fato que perpetua as suas dificuldades e a sua procrastinação a matemática. Estes resultados permitem sugerir a necessidade de que as escolas promovam ambientes que potenciem oportunidades educativas para que os alunos possam compreender a importância do envolvimento no estudo no geral e no completamento dos TPC em particular.

Um aspeto importante, ainda a salientar, refere-se à procrastinação académica das raparigas. O estudo 2 revelou que o envolvimento escolar das raparigas parece estar mais dificultado do que o dos rapazes, devido à expectativa de elevada participação na realização de tarefas domésticas, facto que pode estar ligado a questões culturais que remetem as raparigas para a preparação para o casamento, mais do que para o investimento na sua educação (Taímo, 2015). Estes dados, sugerem a necessidade de as escolas, os pais e professores organizarem projetos de promoção da educação das raparigas. A erradicação do analfabetismo da rapariga em Moçambique passará por este processo.

Os professores entrevistados reportaram que expulsavam os seus alunos como forma de estratégia de diminuir a procrastinação nos TPC de matemática. No entanto, os alunos percebem um efeito contrário, que sustenta as suas dificuldades e dificulta o seu progresso académico. A este respeito a investigação refere que as dificuldades aumentam à medida que as matérias novas vão colocando mais exigências de compreensão (Rosário, Simão, Chaleta, & Grácio, 2008).

Reconhecendo o impacto que a procrastinação académica tem no desempenho dos alunos, consideramos importante que sejam definidos e implementados no sistema educativo de Moçambique programas de promoção de competências de estudo e de autorregulação de aprendizagem que tornem

os alunos proficientes na sua aprendizagem e menos procrastinadores, visando sensibilizar sobre a importância do estudo e dos TPC na aprendizagem. Estes resultados sugerem que sejam implementados no sistema educativo de Moçambique programas que ajudem os alunos na planificação das suas atividades, gestão de tempo nos TPC e sobre como evitar a procrastinação académica. A investigação recomenda a necessidade de criar incentivos aos alunos no completamento dos TPC (e.g., definição das metas dos TPC para a promoção do esforço e persistência) e treino sobre estratégias de estudo (e.g., promoção da motivação intrínseca no estudo) e nos TPC (Bembenutty, 2011, Núñez et al., 2013, 2015).

Torna-se fundamental a promoção da formação contínua a professores em exercício integrando nos programas de formação treino que lhes aporte conhecimentos sobre a importância dos processos autorregulatórios, visando a diminuição da procrastinação académica dos alunos. Seria igualmente importante que as instituições de formação de professores em Moçambique considerem a possibilidade de reorganizar a formação de professores tendo em vista as atuais exigências e reptos colocados ao sistema educativo. Mais concretamente, torna-se importante que os professores percebam os TPC como uma ferramenta educativa que promove a aprendizagem (Xu, 2005; Rosário et al., 2015). Esta conceção possibilitará a compreensão dos alunos sobre a importância da utilidade dos TPC, visando a promoção do envolvimento escolar dos alunos no estudo e nos TPC em particular (Epstein & Van Voorhis, 2001, 2012; Rosário et al., 2015).

Parece-nos premente que os professores considerem a pertinência educativa de algumas práticas reportadas que ocorrem no contexto da sala de aula (e.g., não expulsar os alunos pela falta do completamento dos TPC) e a necessidade de apoiar os alunos nas dificuldades, explicando-lhes a importância de pedir ajuda aos professores de matemática sempre que o necessitem. Estas práticas, entre outras, poderão ajudar os alunos na redução da sua procrastinação académica. A alteração de determinados aspetos da sala de aula, pode ajudar os alunos na redução do comportamento de procrastinação académica (Klingsieck, Grund, Schmid, & Fries, 2013).

Tal como a literatura sugere, os professores deveriam ajustar os TPC marcados ao nível do desempenho dos alunos. Estudos anteriores referem que quando os alunos percebem os TPC como interessantes e úteis para a sua aprendizagem, tendem a esforçar-se mais e a completar o TPC com mais qualidade (Dettmers et al., 2010; Rosário et al., submetido; Trautwein & Lüdtke, 2007, 2009).

Torna-se, ainda, importante que os professores de matemática façam o mapeamento do conhecimento prévio dos seus alunos para que tenham informações sobre as suas potencialidades e dificuldades. Esse conhecimento poderá informar os professores sobre o nível de competências dos seus alunos, servindo de ponto de partida para novas aprendizagens. Os autores salientam que o

conhecimento prévio exerce influência na determinação da prontidão dos alunos para a aquisição de novas aprendizagens e facilita a construção de novos conhecimentos (Siegler & Klahr, 1982; Shuell, 1986). Estas abordagens sugerem a necessidade de um trabalho sistemático e permanente para a colmatação das lacunas dos alunos e a promoção de hábitos de estudo e de responsabilidade (Rosário et al., 2006). Estas orientações sugerem a necessidade dos professores pensarem numa variedade de trabalhos intensivos com alunos que apresentam dificuldades (e.g., "catch up day"; apoio individualizado, apoio suplementar em horário extra) (Good & Bronph, 1997; Rosário et al., 2008) de forma que estas alternativas educativas respondam à superação das suas dificuldades.

4.1 Estudos futuros e implicações para a prática

Esta tese é um primeiro esforço para tentar aprofundar a compreensão sobre os fatores que ajudam a explicar o comportamento de procrastinação académica dos alunos adolescentes de escolas de Moçambique. Reconhecemos que há muito a explorar, não só para a continuidade dos estudos, mas também para o aprofundamento da investigação sobre a temática. Sugerimos que estudos futuros explorem outros anos de escolaridade, alargando a amostra. Por exemplo, seria fundamental explorar outros níveis de transição (Katz et al., 2014). Considerando os resultados do estudo qualitativo (capítulo 2), sugerimos ser relevante explorar como é que variáveis, tais como valor intrínseco, envolvimento parental**,** envolvimento escolar, motivação intrínseca, apoio do professor, explicam a procrastinação académica nos TPC de matemática, realizando estudos multinível. Desejamos que estes estudos possam ser continuados em Moçambique em outras disciplinas para o progresso do processo educativo.

É importante que o sistema educativo considere a possibilidade de desenhar políticas de TPC integrando os seus propósitos e seus benefícios. Estas políticas poderiam ser integradas nos cursos de formação inicial de professores e na formação em exercício. Torna-se, também, importante que as escolas trabalhem com os pais formando-os sobre os benefícios do seu envolvimento nos TPC dos filhos (Cunha et al., 2015; Núñez et al., 2015; Xu & Corno, 2003).

É, igualmente, importante que os alunos se envolvam no seu estudo e no completamento dos TPC, tendo em conta que são os primeiros responsáveis pelo seu processo de aprendizagem (Schunk & Zimmerman, 1998). Esta prática possibilitará aos alunos a compreensão da matéria e dos exercícios, bem como o interesse pela disciplina (Buijs & Admiral, 2013).

Esperamos que este estudo seja instigador do desejo de outros investigadores continuarem o processo de investigação com vista à compreensão do comportamento de procrastinação académica, de modo a incrementar o sucesso académico nas escolas moçambicanas.

REFERÊNCIAS

Balkis, M., & Duru, E. (2016). Procrastination, self-regulation failure, academic life satisfaction, and affective well-being: underregulation or misregulation form. *European Journal of Psychology of Education*, *31*(3), 439-459. doi:10.1007/s10212-015-0266-5.

Baloğlu, M., & Kocak, R. (2006). A multivariate investigation of the differences in mathematics anxiety. *Personality and Individual Differences*, *40*(7), 1325-1335. http://dx.doi.org/10.1016/j.paid.2005.10.009.

Bardin, L. (1996). *The content analysis*. Paris: PUF.

Bardin, L. (1999). *Análisis de contenido* (2. ed.). Madrid, España: Akal.

Bembenutty, H. (2011). Meaningful and maladaptive homework practices: The role of self-efficacy and self-regulation. *Journal of Advanced academics*, *22*(3), 448-473.

Buijs, M., & Admiraal, W. (2013). Homework assignments to enhance student engagement in secondary education. *European Journal of Psychology of Education*, *28*(3), 767-779. doi:10.1007/s10212-012-0139-0.

Byrne, B. M. (1994). *Structural equation modeling with EQS and EQS/Windows: Basic concepts, applications and programing*. Thousand Oaks, California: Sage publications.

Chu, A. H. C., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *The Journal of Social Psychology*, *145*, 245-264. doi: 10.3200/SOCP.145.3.245-264.

Cunha, J., Rosário, P., Macedo, L., Mourão, R., Súarez, N., & Fuentes, S. (2015). Parents' conceptions of their homework involvement in elementary school. *Psicothema*, *27*(2), 159-165. doi: 10.7334/psicothema2014.210

DeRoma, V. M., Young, A., Mabrouk, S. T., Brannan, K. P., Hilleke, R. O & Johnson, K. Y. (2003). Procrastination and student performance on immediate and delayed quizzes. *Education*, *124*, 40 – 48.

Dettmers, S., Trautwein, U., Lüdtke, O., Kunter, M., & Baumert, J. (2010). Homework Works if Quality Is High: Using Multilevel Modeling to Predict the Development of Achievement in Mathematics. *Journal of Educational Psychology*, *102*(2), 467-482. doi: 10.1037/a0018453.

Dietz, F., Hofer, M., & Fries, S. (2007). Individual values, learning routines and academic procrastination. *British Journal of Educational Psychology*, *77*, 893-906. doi: 10.1348/000709906X169076.

Epstein, J. L., & Van Voorhis, F. (2012). The changing debate: From assigning homework to designing homework. In S. Suggate & E. Reese (Eds.), Contemporary debates in child development and education (pp. 263–273). London: Routledge.

Epstein, J. L., & Van Voorhis, F. L. (2001). More than ten minutes: Teachers' roles in designing homework. Educational Psychologist, 36(3), 181-193. doi: 10.1207/S15326985EP3603_4.

Ferrari, J. R., & Scher, S. J. (2000). Toward an understanding of academic and nonacademic tasks procrastinated by students: The use of daily logs. Psychology in the Schools, 37, 359–366. doi: 10.1002/1520-6807.

Ferrari, J. R., & Tice, D. M. (2000). Procrastination as a self-handicap for men and women: A task-avoidance strategy in a laboratory setting. *Journal of Research in Personality*, *34*(1), 73-83. doi:10.1006/jrpe.1999.2261.

Ferrari, J. R., Johnson, J. L., & McCown, W. G. (1995). Procrastination research: a synopsis of existing research perspectives. In J. R. Ferrari, J. L. Johnson, & W. G. McCown (Eds.), Procrastination and task avoidance: theory, research, and treatment (pp. 21–46). New York: Plenum.

Ferrari, J. R., Parker, J. T., & Ware, C. B. (1992). Academic Procrastination: Personality. *Journal of Social Behavior and Personality*, *7*(3), 495-502.

Ferrari, J.R. (2001). Procrastination as self-regulation failure of performance: Effects of cognitive load, self-awareness, and time limits on "working best under pressure." European Journal of Personality 15, 391-406.

González-Pienda, J. A., Núñez Perez, J. C., Solano Pizarro, P., Rosário, P., Mourão, R., Soares, S., Silva, H. E., & Valle, A. (2007). Atitudes face à Matemática e rendimento escolar no Sistema Educativo Espanhol. *Psicologia Teoria, Investigação e Prática*, *12*(1), 151-160.

Gonzalez-Pienda, J. A., Núñez, J. C., Solano, P., Silva, E. H. D., Rosário, P., Mourão, R., & Valle, A. (2006). Olhares de gênero face à Matemática: uma investigação no ensino obrigatório espanhol. *Estudos de Psicologia*, *11*(2), 135-141.

Good, T., & Bronph, J. (1977). *Looking in classroom.* (7th ed.). New York: Longman.

Hagger, M. S., Sultan, S., Hardcastle, S. J., & Chatzisarantis, N. L. (2015). Perceived autonomy support and autonomous motivation toward mathematics activities in educational and out-of-school contexts is related to mathematics homework behavior and attainment. *Contemporary Educational Psychology*, *41*, 111-123. doi.org/10.1016/j.cedpsych.2014.12.002.

Katz, I., Eilot, K., & Nevo, N. (2014). "I'll do it later": Type of motivation, self-efficacy and homework procrastination. *Motivation and Emotion*, *38*(1), 111-119. doi: 10.1007/s11031-013-9366-1.

Klassen, R. M., & Kuzucu, E. (2009). Academic procrastination and motivation of adolescents in Turkey. *Educational Psychology*, *29*(1), 69-81. doi: 10.1080/01443410802478622.

Klassen, R. M., Ang, R. P., Chong, W. H., Krawchuk, L. L., Huan, V. S., Wong, I. Y. F., & Yeo, L. S. (2009). A Cross-Cultural Study of Adolescent Procrastination. *Journal of Research on Adolescence, 19,* 799-811. doi: 10.1111/j.1464-0597.2009.00394.x.

Klassen, R. M., Krawchuk, L. L., & Rajani, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology*, *33*(4), 915-931. doi: 10.1016/j.cedpsych.2007.07.001.

Klingsieck, K. B., Grund, A., Schmid, S., & Fries, S. (2013). Why students procrastinate: A qualitative approach. *Journal of College Student Development*, *54*(4), 397-412. doi: 10.1353/csd.2013.0060.

Knaus, W. (1973). Overcoming procrastination. *Rational Living,* 8, 2-7.

Kim, K. R. & Seo, E. H. (2015). The relationship between procrastination and academic performance: A meta-analysis. *Personality and Individuals Differences, 82*, 26-33. doi: 10.1016/j.paid.2015.02.038.

Lay, C. H. (1992). Trait procrastination and the perception of person-task characteristics. *Journal of Social Behavior and Personality*, *7*(3), 483-494.

Lay, C., & Silverman, S. (1996). Trait procrastination, anxiety, and dilatory behavior. *Personality and Individual Differences*, *21*(1), 61-67.

Lay, C. H., & Schouwenburg, H. C. (1993). Trait procrastination, time management, and academic behavior. *Journal of Social Behavior and Personality*, *8*(4), 647.

Lowinger, R. J., Kuo, B. C., Song, H. A., Mahadevan, L., Kim, E., Liao, K. Y. H., Chang, C. Y; Kwon, K., & Han, S. (2016). Predictors of Academic Procrastination in Asian International College Students. *Journal of Student Affairs Research and Practice*, *53*(1), 90-104. doi: 10.1080/19496591.2016.1110036.

Ministério da Educação e Desenvolvimento Humano (2015). Baixo Desempenho nos Exames Finais: Relatório de Inquérito. Moçambique.

Milgram, N. A., Batori, G., & Mowrer, D. (1993). Correlates of academic procrastination. Journal of School Psychology, 31, 487–500. doi: 10.1016/0022-4405(93)90033-F.

Milgram, N. A., Dangour, W., & Raviv, A. (1992). Situational and personal determinants of academic procrastination. *The Journal of General Psychology*, *119* (2), 123-133. doi**:**10.1080/00221309.1992.9921166.

Núñez, J. C., Suárez, N., Rosário, P., Vallejo, G., Valle, A., & Epstein, J. L. (2015). Relationships between perceived parental involvement in homework, student homework behaviors, and academic achievement: differences among elementary, junior high, and high school students. *Metacognition and learning*, *10*(3), 375-406.

Núñez, J. C., Rosário, P., Vallejo, G., & González-Pienda, J. A. (2013). A longitudinal assessment of the effectiveness of a school-based mentoring program in middle school. *Contemporary Educational Psychology*, *38*(1), 11-21.

OECD (2014b), PISA 2012 Results: Creative problem solving: Students' skills in tackling real-life problems (Volume V), PISA, OECD Publishing. http://dx.doi.org/10.1787/9789264208070-en.

Owens, A. M., & Newbegin, I. (1997). Procrastination in High School Achievement: A Causal Structural Model. *Journal of Social Behavior and Personality*, *12* (4), 869.

Owens, A. M., & Newbegin, I. (2000). Academic Procrastination of Adolescents in English and Mathematics: Gender and Personality Variations. *Journal of Social Behavior and Personality*, *15*(5), 111.

Onatsu-Arvolommi, T., Nurmi, J. E., & Aunola, K. (2002). The development of achievement strategies and academic skills during the first year of primary school. *Learning and Instruction, 12,* 509-527. doi:10.1016/S0959-4752(01)00029-9.

Rosário, P., Costa, M., Núñez, J. C., González-Pienda, J., Solano, P., Valle, A., (2009). Academic Procrastination: Associations with Personal, School and Family Variables. *The Spanish Journal of Psychology, 12*, 118-127.doi: 10.1017/S1138741600001530.

Rosário, P., Simão, A., Chaleta, E. & Grácio, L. (2008). Auto-regular o aprender em sala de aula. In Abrahão, M. (Org), *Professores e Alunos: aprendizagens significativas em comunidades de prática educativa* (pp. 115-132). Porto Alegre: ediPUCRS.

Rosário, P., Núñez, J. C., Vallejo, G., Cunha, J., Nunes, T., Mourão, R., & Pinto, R. (2015). Does homework design matter? The role of homework's purpose in student mathematics achievement. *Contemporary Educational Psychology*, *43*, 10-24.

Rosário, P., Núñez, C., Vallejo, G., Nunes, T., Cunha, J., Fuentes, S. (submitted). Homework purposes, homework behaviors, and academic achievement. Examining the mediating role of students' perceived homework quality. *American Educational Research Journal.*

Saddler, C. D., & Buley, J. (1999). Predictors of academic procrastination in college students. *Psychological Reports*, *84*, 686-688.

Sampaio, R., Polydoro, S., Rosário, P. (2012). Autorregulação da aprendizagem e a procrastinação acadêmica em estudantes universitários. *Cadernos de Educação, 42*, 199-142.

Senécal, Caroline, Koestner, Richard, Vallerand, Robert J. 1995. Self-regulation and academic procrastination. The Journal of Social Psychology. 135 (5): 607–619. doi: 10.1080/00224545.1995.9712234

Schouwenburg, H. C. (1995). Academic procrastination: Theoretical notions, measurement, and research. In J. R. Ferrari & J. L. Johnson (Eds.), *Procrastination and task avoidance: Theory, Research, and Treatment* (pp. 71 – 96). New York: Plenum Press.

Schunk, D. H., & Zimmerman, B. J. (1998). Conclusions and future directions for academic interventions. In D. H. Schunk & B. J. Zimmerman (Eds.), S*elfregulated learning. From teaching to self-Reflective Practice* (pp. 225-234). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Shuell, T. J. (1986). Cognitive conception of learning. *Review of Educational Psychology*, 56, 4, 411-436, doi: 10.3102/00346543056004411.

Siegler, R. S. & Klahr, D. (1982). When do children learn? The relationship between existing knowledge and the acquisition of new knowledge. In R. Glaser (Ed.), *Advances in instructional psychology* (Vol. 2, pp. 121-211). Hillsdale, NJ: Lawrence Erlbaum Associates.

Schraw, G., Wadkins, T., & Olafson, L. (2007). Doing the things we do: A grounded theory of academic procrastination. *Journal of Educational Psychology*, *99*(1), 12-25. doi:10.1037/0022-0663.99.1.12

Steel, P. (2007). The nature of procrastination: a meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, *133*(1), 65-94.

Taímo, N. V. (2015). Keeping Girls in School: Building the capacity of the women and education association in Mozambique. Oxfam Novib.

Trautwein, U., & Lüdtke, O. (2007). Students` Self-Reported Effort and Time on Homework in Six School Subjects: Between-Students Differences and Within-Student Variation. *Journal of Educational Psychology, 99*(2), 432-444. doi: 10.1037/0022-0663.99.2.432.

Trautwein, U., & Lüdtke, O. (2009). Predicting homework motivation and homework effort in six school subjects: The role of person and family characteristics, classroom factors, and school track. *Learning and Instruction, 19*(3), 243-258. doi:10.1016/j.learninstruc.2008.05.001.

Wäschle, K., Allgaier, A., Lachner, A., Fink, S., & Nückles, M. (2014). Procrastination and Self-efficacy: Tracing vicious and virtuous circles in self-regulated learning. *Learning and Instruction, 29*, 103-114. http://dx.doi.org/10.1016/j.

Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist*, *38*(4), 189-205. doi: 10.1080/00221309.1992.9921166.

Xu, J. (2005). Purposes for doing homework reported by middle and high school students. The Journal of Educational Research, 99(1), 46-55. doi: 10.3200/JOER.99.1.46-55

Xu, J., & Corno, L. (2003). Family help and homework management reported by middle school students. *The Elementary School Journal*, *103*(5), 503-517.

Yerdelen, S., McCaffrey, A., & Klassen, R. M. (2016). Longitudinal examination of procrastination and anxiety. doi: 10.12738/estp.2016.1.0108.

Yu, R., & Singh, K. (2016). Teacher support, instructional practices, student motivation, and mathematics achievement in high school. *The Journal of Educational Research*, 1-14. doi: 10.1080/00220671.2016.1204260.